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April, 1918



Vol. XXI, No. 4

THE NATIONAL MAGAZINE OF MOTOR BOATING

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## Great Lakes Express Cruisers

### The Fifty Foot Express Cruiser

**T**HE two illustrations above are of the Standardized Fifty Foot Great Lakes Express Cruiser. A number of which have been built and put into service during the past four years and have given splendid satisfaction, dependable and efficient service.

A standardized boat, both as to construction and equipment. Speed from 20 to 24 miles per hour. Two of these Fifty Footers are now completely finished and are ready for immediate shipment. Delivery on additional boats governed by factory conditions.

A highly successful, comfortable and satisfactory boat. Briefly, accommodations consist of crews' quarters forward followed by galley; forward stateroom; bridge deck with engine under the bridge; after stateroom and after cockpit.

Telegraph or write for full details to-day. Ask for Booklet No. A5 describing and illustrating this Fifty Footer in detail.

### The Fifty-two Foot Express Cruiser

**T**HE illustration at the bottom of this page is of the new Fifty-two Foot Great Lakes Express Cruiser, the 1918 edition of the Standardized Express Cruiser, the last word in Cruiser design and construction.

In this fifty-two foot boat eight people and a crew of two are comfortably accommodated. Up forward is located the steward's quarters, followed by a large galley and completely equipt with refrigerator, stove, etc. Aft of which is the forward stateroom with berths for two or four people and a connecting toilet. Then comes the big Bridge Deck with the engine room partly under it and partly enclosed in a trunk cabin giving engineer full headroom. Crew's quarters and toilet located in engine room. Immediately aft of the Bridge Deck comes the splendidly equipt Owner's Stateroom with connecting lavatory, aft of which is the commodious after cockpit.

Write immediately for full description, blueprints, etc., of this unique craft; it's really a wonderful boat.

**GREAT LAKES BOAT BUILDING COR**

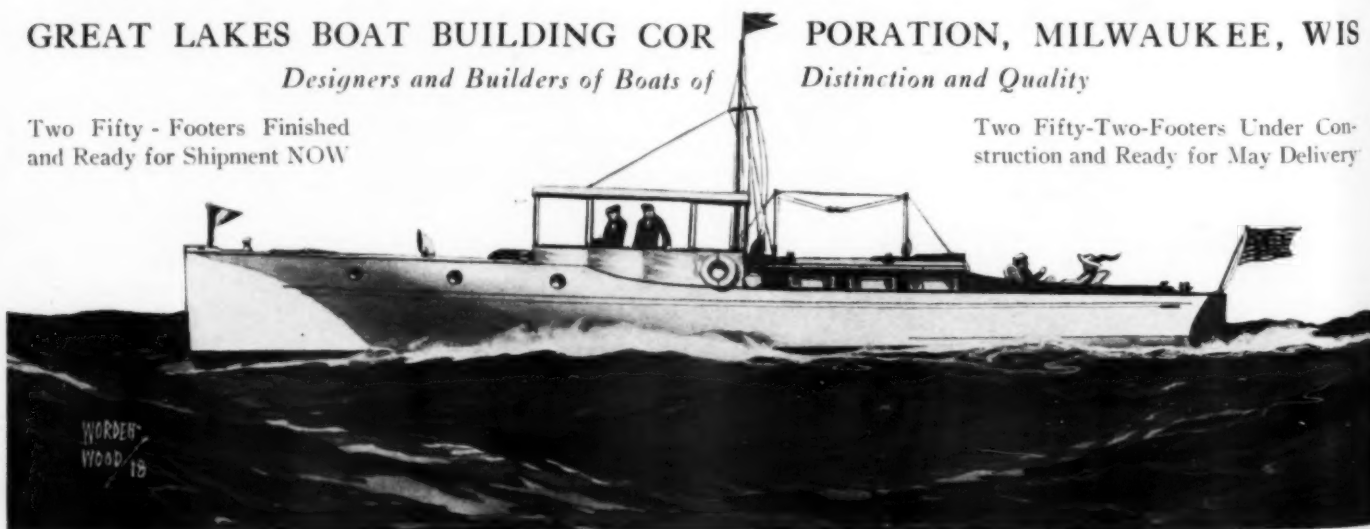
*Designers and Builders of Boats of*

Two Fifty - Footers Finished  
and Ready for Shipment NOW

**PORATION, MILWAUKEE, WIS**

*Distinction and Quality*

Two Fifty-Two-Footers Under Con-  
struction and Ready for May Delivery



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Advertising Index will be found on page 102



Photograph by Rosenfeld

## Go Into Commission This Spring

No Cessation of Motor Boating Activities Advisable—Races and Club Competition Should Be Held as Usual—Yachting Recognized as Essential to the Welfare of the Nation

**B**OTH our honorable Secretary of the Navy, Josephus Daniels, and his Assistant Secretary, Franklin D. Roosevelt, have come out in no mild terms in favor of motor boating and other yachting activities during the coming summer and throughout the duration of the war. Mr. Roosevelt is a yachtsman himself, a member of the New York and other prominent yacht clubs, a yacht owner, who sails his own ship and therefore knows yachting and yachtsmen. Coming from a man so high up in diplomatic and yachting circles, Mr. Roosevelt's advice can be said to set the styles in boating for the next year or two at least.

But the ideas of Mr. Daniels and Mr. Roosevelt are not unlike those which are being expressed in every other branch of governmental service to-day. In the army, particularly in the draft camps, a vital feature is being made of athletics and other forms of physical training. Thousands of dollars are being spent to-day in their development. In fact, the training of the million of young men now serving in the army comprises to a very large extent physical exercises, being out in the open and getting back close to nature. That a company of men can execute "column right" or "left front into line" with exact precision does not necessarily mean that these men will be of great service to their country when the real test comes. Their value and worth depends almost entirely upon their physical condition, as well as their endurance qualities, which bears a direct relation to the former state. This state of perfect physical condition, due to their life and their environments in

camp, is essential to the successful military man whether he be an officer or a private, in the front line trenches or directing an important campaign from a desk in Washington.

So it is in the life of the civilian who perhaps may never be called upon to shoulder a rifle or even is unfit to do so. He must have his health and this health can best, yes, perhaps only, be obtained by maintaining sufficient out of door life and exercise. It is almost as important to the future of our nation and to the winning of this struggle for democracy as the health of the soldier himself.

In the colleges and universities where physical condition has been rated on a par with excellence of mind, the first tendency upon the cry of War was to abandon all forms of athletics and intercollegiate competition. The fallacy of this plan was soon apparent. Now the colleges have all returned to the schedules of normal times with a few possible exceptions which can be directly traced to other motives.

Not even by the wildest stretch of one's imagination can one picture a more healthful and beneficial pastime than motor boating and yachting. That the participant is deriving a great amount of pleasure in his healthful pursuits can not be a cause for condemning him as an unpatriotic or disloyal citizen.

The drainage upon the country's supply of fuel has often been advanced by a certain few as a reason for inactivity during the war. This excuse is really too absurd to be worth a word of explanation. If the situation were fully and im-

(Continued on page 82)

## Develop Inland Waterways

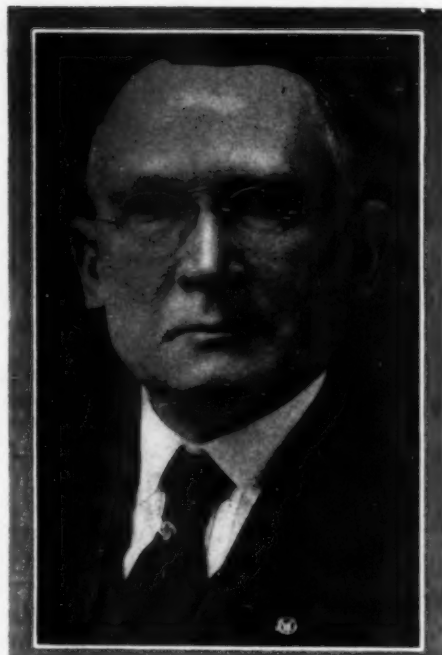
By S. A. Thompson



Hon. Jos. E. Ransdell, President of the National Rivers and Harbors Congress

**A** NEW era in the usefulness of motor craft is upon us. Up to the present time the general public has looked upon the motor boat as a vehicle of pleasure, a sort of luxury to a more or less extent and something which could be entirely discarded if necessary. But to-day public opinion has reversed itself. The motor boat is recognized as an essential, as necessary to the economic development of the country as the motor truck or motor deliveries in the suburban sections.

The inland waterways of the country provide arteries for the transportation of fuel, supplies, and merchandise with which even the railroads cannot compete. The motor boat, motor barge, and motor tug will be the heart which maintains the flow of traffic through these arteries.



Mr. S. A. Thompson, Secretary of the National Rivers and Harbors Congress

**P**ROBABLY Tom Carter was more responsible for starting the National Rivers and Harbors Congress than anybody else, although it is certain that nothing was further from his intention. Tom—we Americans mean no disrespect when we call our public men by their first names—was a Senator from Montana, who, in 1901, distinguished himself by talking a Rivers and Harbors bill to death. Recently a change has been made so that it is now possible for two-thirds of the Senate to put a limit on debate and bring a measure to a vote, but in those days a Senator was allowed to talk just as long as he pleased, or until his voice gave out. Thus, in the closing days of a short session, which must come to an end at noon on the fourth of March, one man could kill any legislation to which he was opposed, even if every other member of the Senate and every other citizens of the United States was in favor of it.

Senator Carter had secured the insertion of an amendment making an appropriation for the irrigation of some arid lands in Montana, but when the bill got into conference the conferees on the part of the House absolutely refused to let this item remain in the bill, saying that Rivers and Harbors bills are meant to promote navigation and that none of the streams in that region were big enough to float a birch bark canoe. Whereupon the Senator from Montana grew exceedingly wroth and declared that either his amendment would stay in the bill—or there wouldn't be any bill.

The conferees stood pat and so did Tom, who began to talk. Time went on, and Tom talked on, and he kept on talking until the hour of twelve o'clock arrived—and his Senatorial career, the fifty-sixth Congress and the Rivers and Harbors bill all died at one and the same time.

The bill which thus came to an untimely end was the largest

that had been prepared up to that time. As presented by the House Committee on Rivers and Harbors it carried, in direct appropriations and contract authorizations, a total of \$61,628,162, and it provided for the maintenance and improvement of waterways and harbors in every part of the United States. It was natural, therefore, that Senator Carter's action aroused widespread resentment and provoked a great many cursory remarks. Among the items in the murdered bill was one for deepening the mouth of the Mississippi to 35 feet, a matter of vital importance to the Port of New Orleans. Whether or not they were madder than any one else can not be told, but two of the business men of that city—M. J. Sanders and John W. Bryant—turned their anger into action. The result of their activities was the calling of a National Rivers and Harbors Congress, which was held in McCoy Hall, of Johns Hopkins University, in Baltimore, on the 8th and 9th of October, 1901.

Resolutions demanding the continued improvement of waterways and harbors were passed by acclamation, and it was decided to form a permanent organization to work for that end. The name used in the call for the convention was adopted as the official title, the late Hon. George E. Bartol, of Philadelphia, was chosen as the first president, and an executive committee was appointed to carry on the work. This committee published the proceedings of the convention and then lapsed into innocuous desuetude. Perhaps this was because they thought the desired result had been achieved, for, as a result of the interest that had been stirred up, a bill was passed in the following year which carried the substantial total of \$65,107,102. It must be remembered, however, that in those days river and harbor bills were passed only once in three years.

(To be continued)



There are hundreds of miles of inland waterways not unlike the above which are now navigable for small craft and which could be made available for large tonnage at small cost



Hon. Franklin D. Roosevelt, assistant secretary of the Navy, whose pet plan it is to obtain from the motor boatmen and other yachtsmen of the country enough marine glasses and navigating instruments to supply the extraordinary needs of the Navy at this time. The above photograph of Mr. Roosevelt was obtained for MoToR Boating exclusively



**Will YOU supply EYES for the NAVY?**  
NAVY SHIPS NEED BINOCULARS AND SPY-GLASSES  
Glasses will be returned on termination of War, if possible.  
One Dollar will be paid for each pair returned.  
Tag each Article with name, home, and address and Express or Mail to:  
Hon. Franklin D. Roosevelt, Asst. Sec'y of Navy,  
33 Naval Observatory—Washington, D. C.  
**WILL YOU HELP US STAND WATCH ON A DESTROYER?**

## The Navy Needs Your Eyes

Thousands of Motor Boatmen Have Already Responded to the Nation's Call for Marine Glasses and Navigating Instruments

*Photographs by International Film Service*

**H**AVE you a pair of binoculars, a prism glass, a spy-glass, a telescope, a sextant, octant, quadrant or chronometer that you don't absolutely need in your business?  
If you have, the Navy wants them—wants them badly.

It needs them because the imports of optical glass have stopped. For reasons which need not be elaborately explained here neither Germany nor Austria is shipping either glass or finished instruments to the United States just now. And so far, American glass makers haven't been able to produce the quality needed in optical instruments in any appreciable quantity. Moreover, the great optical firms of this country are swamped in optical work of even greater importance than the making of hand glasses and navigation instruments, and the chronometer makers can't begin to supply the demand.

So the Navy appeals to the private owner.

"Send us your glasses, your instruments, your chronometers," it asks you. "The law won't let us take them as a gift—so we pay you a dollar for every item you send. We don't care whether you spend the dollar or frame it. We will take the best care of your patriotic offering we can. We will tag each instrument with a small metal tag, made of the same monometal, indestructible by sea, water, or fire, of which the tags worn by all the Navy personnel are made. We will engrave your name and address on the tag, and also engrave on the instrument, somewhere, a key number, which corresponds to a number in a record book at the Naval Observatory in which your name and address is recorded. After the war, we will send back your contribution if it has survived. We can't guarantee that it will—accidents do happen. But we will make every effort to return your property when we no longer need it, and if it isn't returned, at least you will know that your Navy made good use of it."



Each glass which is received is thoroughly tested out by naval officers. Those instruments which are found unsuitable for naval purposes are promptly returned to their owner

Donors of glasses should not think of them as issued to any particular officer or enlisted man, to be used by him exclusively. Glasses are assigned to ships, not to men. It is, however, by no means improbable that, when a glass has accomplished some distinctive service, such as the discovery of a subma-

Tagging the glasses. A white metal tag is permanently attached to each instrument giving the name and address of the owner



Just one day's receipts of marine glasses, binoculars and telescopes

rine, the lookout who accomplished the feat might be moved to write the owner of the glass and tell him about it. This he could readily do, since every glass bears the owner's name and address on the tag. This, of course, would be a private matter, between the user and the owner of the glass, and the Navy makes no such promise or even suggests the possibility. But if you or the Editor or the writer were to discover a Hun devil fish, which our gunners sent to the bottom, and under our hands was a neat little tag telling us that the glass which enabled us to make the discovery belonged to John Smith of 111 North-South Forty-leventh St., Yorkidelphia, we'd do it, wouldn't we?

So far, 14,000 glasses of all possible varieties have been received. Of these, about 700 have been returned immediately, because they were either unsuitable or in such condition as to make them unserviceable. Most of those returned have been opera glasses. The Navy cannot use opera glasses in looking for submarines, and the opportunities for the enlisted personnel and the officers to attend operas are too limited to make opera glasses needed. But any and every other kind of glass, from a modest three or four power up to the limit, is accepted with genuine and sincere thanks, and every one, by the way, is acknowledged with a personal letter from Assistant Secretary, Franklin D. Roosevelt,

whose pet scheme this is to aid the man behind the gun to find the periscope at which to shoot.

The tremendous demand—the Navy can use 50,000 glasses without any difficulty—has come not only from the huge increase in floating units, but the greatly increased numbers of men on every vessel at sea whose business it is to watch, watch, watch for the Prussian shark. This lookout, by the way, is a matter of vital importance—not a mere routine. A certain number of men on every ship at sea will be constantly at work sweeping their particular segment of the horizon, and the water between them and the horizon, looking for submarines. If one discovers a periscope, the others don't stop to look at what he sees. They look all the harder at their appointed area, for marines have been known to travel in pairs and sometimes come in triplets.

The prism glass, of all powers, is greatly needed for day work. Having a large field and great power in small compass, it is ideal for submarine hunting during daylight. Due to the small size of the object glasses, however, it is of small service as a night glass, and here the spy-glass of older days, and more modern Galilean binoculars with large object lenses and restricted power, comes into play.

But the Navy's need is not limited to hand glasses. Telescopes of all sorts are wanted. Any size, any power, and any type, whether astronomical or terrestrial, are greatly sought. The astronomical telescopes will be promptly equipped with an erecting system and the Navy's own mount. Contributors are urged not to send tripods or stands of any sort with telescopes—what is wanted is the tube and lenses. The Navy can attend to the proper mounting, if the instrument is big enough to need a mount.

Equally as important as the hand glass, is the navigation instrument. There are

(Continued on page 92)

IN REPLY ADDRESS  
THE SECRETARY OF THE NAVY  
AND REFER TO NO.

302-119  
D/S

NAVY DEPARTMENT  
WASHINGTON

March 6, 1918.

Dear Sir:

Permit me to extend my sincere thanks for the spirit of co-operation contained in your letter of February 28th.

Several weeks ago the Navy, through the daily press, made an appeal for binoculars, spyglasses, and telescopes and although 25,000 pairs have been received so far, many more are required in addition to which there is an urgent need for sextants, octants, quadrants and chronometers.

The Navy must depend upon the generosity and patriotism of private individuals and in this connection, I am taking the liberty of making an earnest appeal, through the columns of your magazine to the boatmen and yachtsmen of the country, who, I understand, possess between 50,000 and 75,000 instruments of the highest type to respond to this urgent need.

So that all articles which are received may be acknowledged, I request that they be tagged with the name and address of the donor and forwarded by mail or express to Franklin D. Roosevelt, Assistant Secretary of the Navy, care of Naval Observatory, Washington, D.C. Those which meet the Navy's requirements will be permanently recorded at the Navy Department and in the event of their existence at the termination of the war, returned. It is, of course, impossible to guarantee them against damage or loss.

As the Government cannot under the law accept services or material without making some payment therefor, one dollar will be paid for each article accepted, which sum will constitute the rental price, or in the event of loss the purchase price of such article.

Very truly yours,

*Franklin D. Roosevelt*  
Assistant Secretary of the Navy.

C. F. Chapman, Esq.,  
Editor, "Motor Boating",  
119 West 40th Street,  
New York City.

Reproduction of a letter received from Mr. Roosevelt in which he appeals to the readers of MoToR Boating to send their marine glasses to the Navy



### AiR Boating

Each day brings from the battle front some new story of the birdman's adventure. Newspapers are filled with the exploits of our aviators. Gradually an appreciation of their problems and accomplishments wakens in the consciousness of the public.

Our factories are busy trying out new devices to promote the efficiency and the safety of flight.

Our ground schools and training camps are preparing the flyers who will largely decide the issues of the war for democracy and everywhere all signs point to the most colossal flying service imaginable. Back of all this the scientific and mechanical genius America sees a flying sport and an industry even greater than the war-time development of aeronautics.

# Why Does an Airplane Fly—

A Ship Float—A Balloon Rise—A Hydroplane Plane, and a Submarine Sink?

By W. B. Stout

**S**HIPS, from the humble beginning of Adam's log, have been brought to a high state of being; proud of accomplishment, breasting aside all obstruction, laughing at wind and wave. Swelling even more in their pride they are now spurning the earth and sea beneath them and floating off into the air, or taking wing in flight to far distant points in the service of man.

They that go down to the sea in ships are mentioned favorably in the scriptures, but who shall sing the praises of those who now go into the air in ships, in the newer service of mankind.

All engineering is a development, a growth; a metamorphosis, it has been in transportation from a chrysalis state of perfection to the crawling locomotion of the worm and now, through the final stage, to the flying freedom of the butterfly. What the steam engine gave to sea travel and the possibility of fast overseas work, the gasoline prime mover has given to air travel, and now we fit our boat with wings.

The man used to boats and the sea can understand readily the good qualities of one craft and another, but few visualize the similarity between the new ships of the air and the ships of the sea. It can all be explained by displacement.

Any object can float if it can displace, when put into water, a weight of water equal to itself.

Figure 1 shows a block weighing 10 pounds, held over a pail of water full to the brim. If we drop the block carefully into the water it will thrust aside or displace a certain amount of water before it rests floating on the surface. If you allow this water to run over, into a pan beneath, you will find that the weight of the water displaced and spilled will be 10 pounds, or the weight of the floating object. If you drop a stone into the water, it will, of course, sink, and you will find that the water displaced will not be as heavy as the stone itself.

To float, then, an object must displace in the water a weight of water equal to its own weight. This is why steel ships float.

Steel in itself will not float, but when fashioned into such shape that it will displace more water than its own weight then the steel ship floats. All of this is, of course, perfectly obvious to the boatman and the boat designer, but is made clear that later reasoning may be the more easily followed.

A ship to hold a certain tonnage is designed to displace water enough to equal in weight the weight of the cargo desired, plus the weight of the ship, and the weight of the water displaced, conversely, determines the weight of the ship and its load.

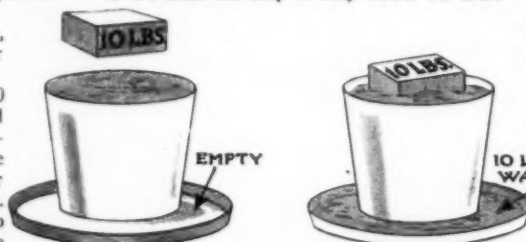
These principles of flotation in water obtain also in air work, except that water weighs about 800 times as much as air. This means that an air ship must have a balloon displacing 800 times as much air as a water ship must displace water for the same load, which is the reason why airships are so large for the load they carry. A tugboat in water can carry more load than a giant Zeppelin in the air, though not so fast. An airship in the air follows the same law as a boat on the sea and must displace a weight of air equal to the weight of the ship and its gas plus the weight carried. It is displacement in pounds that counts.

There is a difference, however, between our ships of the sea and those of the air, for the water kind float on a surface—and a very definite surface—being sustained by the weight of the water underneath. The ship of the air

is sustained in the medium in which it floats, like the submarine, and has no definite surface to come up to but rather a sea bottom to come down to. If submarines were operated by fishes who could not live except in the depths of the sea, and hence could never come to the surface permanently, they would be in much the same position as airships operated by man, for man cannot live out of his sea of air.

A submarine floats by its displacement of water and is so designed that it displaces an amount of water about equal to its own weight. Thus, when empty, it floats like any other ship, with, say, 1,000 pounds of conning tower and deck out of the water. If one lets 1,000 pounds of water into the submarine's tanks it will start to sink, since it has no buoyancy, but is practically balanced in the water. If, then, we start the submarine forward a very little effort on rudders and fins—which in the air we would call wings—will steer the submarine up or down. It is by adding weight of water to the submarine that we make it balance in the water so closely that the effort of rudders, when the ship is moving forward, can steer it up and down.

If we wish the ship to stay down we draw



EXPLAINING "DISPLACEMENT"  
FIG. 1. FIG. 2.

in more weight of water and let the ship sink to the bottom, or as deep as we wish, and there it will stay until we pump water enough out to restore its lightness to equal the displacement of the hull. When it becomes lighter than the water it displaces the boat will rise.

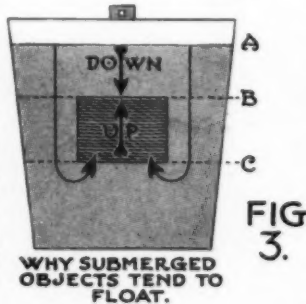


FIG. 3.

This is shown in Figure 3, and you can see how the weight of the water on top of the block shown submerged presses down from a to b. Water, being a perfect fluid, extends its pressures equally in all directions so that, below the block, the distance a-c down the pressure is underneath pushing up. The pressure on all four sides of the block equalizes so that there is no tendency for the block to move sideways, but since the pressure on top of the block is the weight of the water depth a-b and that on the bottom is the greater pressure through the water depth a-c, thus pressure tends to force the block up to the surface until it reaches the point where the pressure from beneath equals the weight of the water column the block displaces. An object heavier than water will not float, but in the water it will be as much lighter than in the air as the volume of water weighs that it displaces.

All of this primer explanation regarding water applies equally well to objects immersed in air, and all objects on the earth's surface are immersed in air. It is necessary for flotation that there be a pressure from beneath equal to the weight of the object being sustained.

The first step in air travel reasoning came from the airship. The steerable balloon was the most obvious solution for earlier experimenters, and much of real aerodynamic reasoning and research was done long ago and in real rational fashion, but of no effect because there was at that time no engine light enough to drive the designs. Only with the arrival of the gasoline engine did we come to a possibility in air navigation, and with the experiments of Santos Dumont the world saw new possibilities for air travel, though tremendously skeptical.

Dumont had much to overcome. He had little to go by. He had small and poor engines, poor plugs, poor carburetion and poor everything. He had little data on balloons and less on propellers. He stayed by the work, however, until he made a ship that flew—and proved the airship possible.

Dumont found out some of the variations in the upper air, cold currents and warm currents, and sun heat and night cold and visioned some of the things that would need to be overcome in airships before they could be a success. It was not long before he abandoned the airship for the newer experiment—the flying machine, or airplane.

Others, however, carried on the work and learned much. Ships on the sea gave Zeppelin an idea and he attacked a new angle.

There is a law in physics, due to the fact that surfaces have two dimensions and volumes have three, that makes the following fundamentally a fact: If you make a thing twice as big it has four times as much surface and eight times the volume or weight. Thus, in ships in the sea, it only takes four times as much plate steel to make a ship twice as big in dimension—all things being equal—and it has but four times the skin fraction, but it will carry eight times the load. This is why big ships on the sea are the most economical. This is also why Zeppelin started building big airships. It took only four times as much silk to make a balloon twice as big, but it would lift eight times the weight. Hence the Zeppelin.

It did not take long to learn the limitations of the airship, however, as regards speed, landing difficulty, controllability, etc., and attention turned again to airplanes.

An airplane differs from an airship as a hydroplane differs from a displacement speed boat. The hydroplane gets its displacement reaction from planes striking the water at an angle, and at such speed that the weight of the water hit at normal speed equals the weight of the boat. Suppose you hold a 1-pound ball in your hand. If you strike it with a bat at a certain speed there will be a reaction, the ball going in one direction and the bat rebounding in the other. If you hit the ball twice as hard there will be four times the reaction, so that the speed of the bat is a factor in the power behind the ball and varies as the square of the speed.

If you hit a tennis ball with a racket the ball will go forward and down, spinning, while the racket will rebound straight up, since the inertia of the moving racket forward neutralizes the back thrust of the ball as it is struck and the resultant merely throws the racket into the air.

(Continued on page 64)

# **AIR *has* WEIGHT - INERTIA - AND MOMENTUM - *and* RESISTS MOVEMENT**

ITS THAT RESISTANCE WHICH MAKES  
FLIGHT POSSIBLE.



## **AN AIRPLANE**

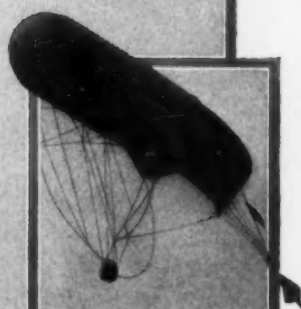
FLIES *by* REASON  
OF ITS SPEED AND  
SUPPORTS ITSELF  
IN ITS MEDIUM-  
BY



## **IMPACT DISPLACEMENT OF AIR**



THE DISPLACEMENT  
OF WATER WHICH  
CAUSES A SHIP  
TO FLOAT IS NOT  
IMPACT DISPLACE-  
MENT - BUT IS  
ACTUAL  
DISPLACEMENT



THE DISPLACEMENT  
OF AIR WHICH  
CAUSES A BALLOON  
TO FLOAT IS NOT  
IMPACT DISPLACE-  
MENT - BUT IS  
ACTUAL  
DISPLACEMENT



A SUBMARINE  
WHEN SUBMERGED  
AND UNDER WAY  
IS SUPPORTED IN  
ITS MEDIUM BY

## **IMPACT DISPLACEMENT OF WATER**

A HYDROPLANE SKIMS  
OVER THE SURFACE  
OF THE WATER BY  
REASON OF ITS SPEED  
AND GETS SUPPORT  
BY

Illustrating the forces which are responsible for causing the different types of ships to perform their various functions. For the slow cargo vessel, balloon and motor cruiser, speed is not a necessary factor to keep them afloat, as the water or air which they displace does the trick. But with the airplane, hydroplane and the submarine more than mere displacement of the surrounding medium is necessary

Picturized by Frank Merritt

# Air Mail Service Established



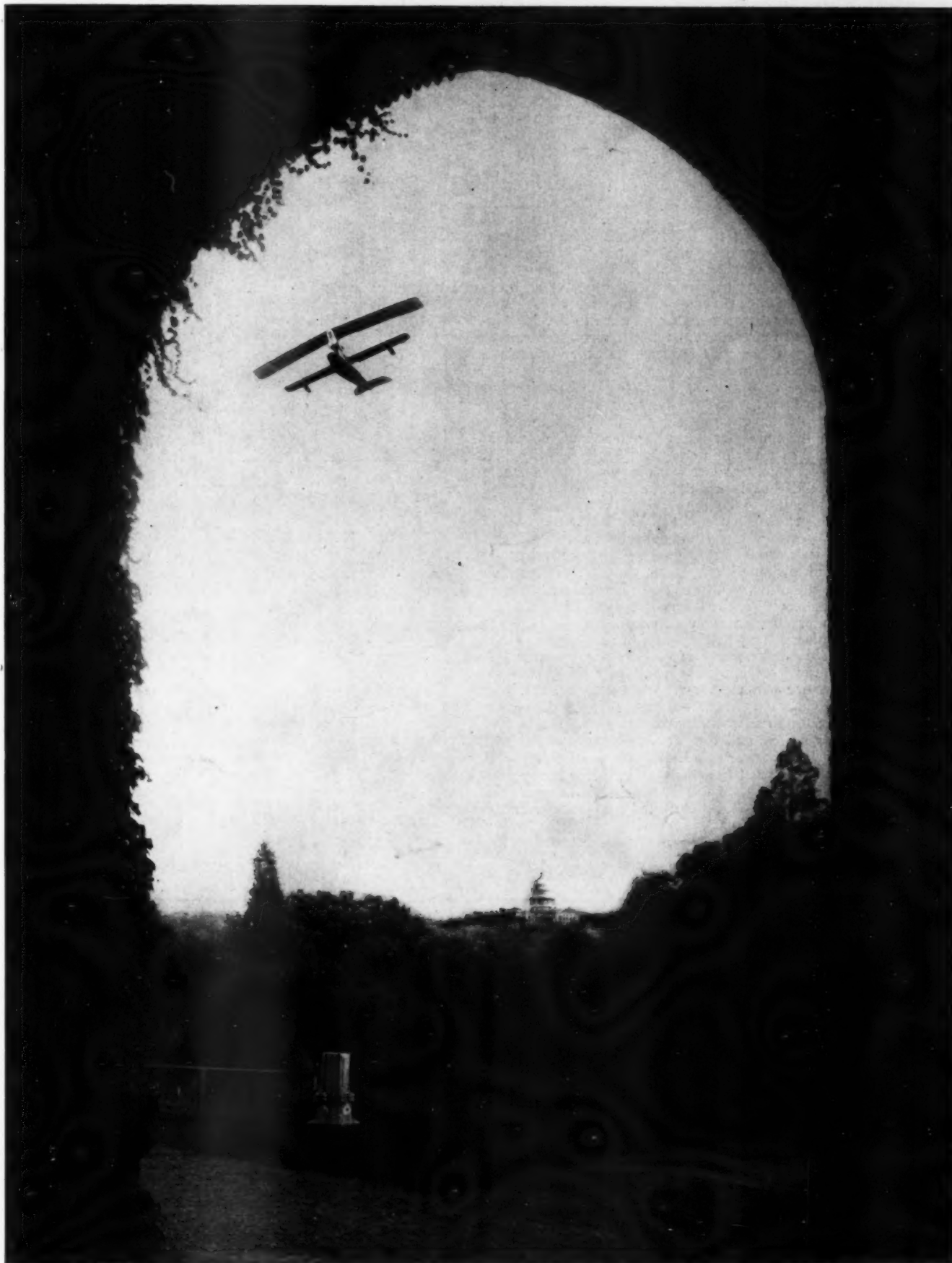
The one department of the U. S. Government whose activities are brought to the attention of the public most intimately and most often, yet sometimes without appreciation of the service rendered, is the Post Office Department.

Starting with the stage coach and sailing packet, the U. S. Mail has been successively carried by the railroads, steamships, motor boats, auto-

mobiles, and pneumatic tubes, all in the effort to provide the quickest means of communication.

With the entry of this country into the Great War the need of a still greater saving of time became imperative. To meet this demand the Government has organized an aerial mail service between Washington, Philadelphia, and New York.

# Between New York and Washington



The airplanes for this service will be capable of carrying 300 pounds of mail at a speed of 100 m.p.h. They are able to climb at a rate of 6,000 feet in 10 minutes, and in addition they can travel as slow as 45 m.p.h. with full load. These three characteristics embodied in one airplane will assure a minimum loss of time in starting and alighting and finding the most favorable air currents along the route.

This service is inaugurated with five airplanes that travel on scheduled trips as regularly as any fast train service, and with the same certainty. There is no chance of traffic congestion in the air such as the railroads suffered from during the recent winter.

The idea of aerial mail service has been tried experimentally in  
(Continued on page 92)

# Linking the North and South

The Perfection of the Air Cruiser for Carrying Passengers and Freight the Next Step in Aircraft Development. Boston to Atlanta Will Soon Be Possible

**R**ECENTLY the slogan everywhere has been, "Win the War Through the Air" by demolishing Germany's submarine base at Sebrugge, blowing up the Krupp works and striking at important German naval and military bases.

Various attempts upon these strongholds have been made by the Allied air forces, but with comparatively little success. Doubt has arisen in the minds of some of the ability of the airplane, as at present developed, to do sufficient permanent damage. Can this be true? The recent attack on Essen has proven beyond question that the airplane can make the flight, can inflict some damage and can make its return safely. But has the damage been of much real military value?

It would appear that the heavier-than-air machine as heretofore developed is not capable of inflicting damage to any great extent. Therefore, we must look forward to the development of another and more efficient type of aircraft. As the dirigible does not meet the requirements, necessity points the demand for a real battle cruiser.

The requirements are for a machine capable of carrying at least eight men and fuel necessary for a flight of ten hours' duration with the motors running at full speed, and attaining a speed of 90 to 100 miles per hour. Such a machine would carry a useful load of a ton or more, such as ammunition and bombs. It would mount guns at various points on a stable platform and would thus insure a large radius of fire in all directions. This would make it practically impossible for a small machine to get close enough to bring the battle cruiser within the range of its necessarily smaller guns.

The battle cruiser would have high carrying capacity and the ability to fly at low speeds with great stability. This stability would make attention to the engines, accurate aiming of the guns and the careful and efficient dropping of bombs far in the enemy's rear comparatively easy.

The battle cruiser's long flying duration and high and low speeds would make it an ideal reconnaissance machine. It could carry the most efficient installation of sending and receiving long distance wireless for reporting gunfire, verifying movements and general aerial observation. It would be unexcelled for coast patrol work in reporting the location of enemy and other vessels and for sighting from high altitudes submerged craft or mines or other instruments of war.

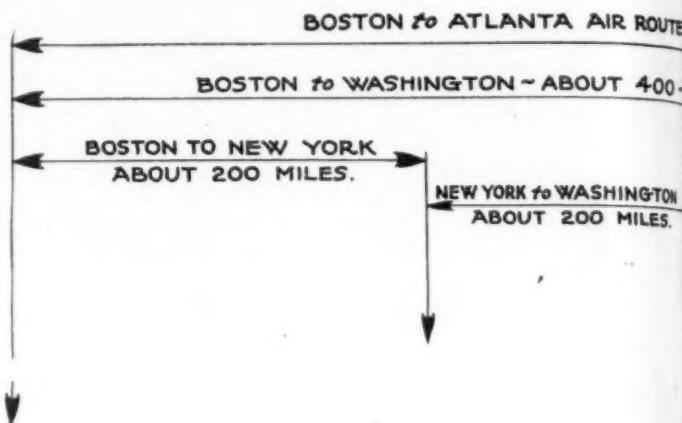
All fighting planes are at times subjected to the heavy gunfire of the anti-aircraft guns, and machines often become crippled or have to descend to the earth with a crash over the enemy's or their own territory. This often means the loss of a valuable machine and frequently proves fatal to the observer.

In the design of the Wittman-Lewis cruiser here

illustrated allowances have been made to materially reduce these difficulties. Its size and the variation of its supporting surfaces enable it to sustain considerable injury without being put even temporarily out of commission. It would carry three engines, aggregating approximately 1,000 h.p., and with two of its engines disabled could still pursue its course. Comparing this type with the present machine, we find it more efficient, longer-lived, and safer.

To carry two tons of bombs in one battle cruiser means that 500 such cruisers could in a few hours dispatch 2,000,000 pounds of explosives far into the enemy's territory, and create great havoc—possibly destroying so much ammunition as to render the enemy's army temporarily incapacitated for determined resistance.

The question arises, "To what advantageous use can these air cruisers be put when



Photograph by Paul Thompson

British Handley-Page twin-motored air cruiser, used as a bombing machine, as compared with the one made a 2,000-mile flight—from Sweden to Constantinople—by way of Paris, Lyons, Marseilles, Spezia.

the war is over and their grim work has been completed?"

The answer is: The after-war future of this cruiser is as important as its present need to win the war for the Allies.

The ready removal of the guns and military equipment would make room for an increased weight of mail matter. For postal service this type of cruiser could hardly be excelled.

It can be used to great advantage and profit for passenger service. The cruiser that could carry two tons of explosives

could carry twenty-five passengers a distance of one hundred miles in less than one hour.

For locating and destroying derelicts and for discovering vessels in distress and rescuing castaways the aerial cruiser would supply sufficient capacity, stability, and safety of flight.

The ready interchangeability from peace to war service (as vice versa) would mean that a large fleet of aerial cruisers in peace time employed in a rapid mail and passenger service would be a large element in our military and naval preparedness when an emergency arose.

The successful and profitable employment of the aerial cruiser for passenger service is now only a matter of providing substantial cruisers of sufficient size to carry the necessary number of passengers to enable the aerial cruiser to operate at a profit. The air cruiser line, like the passenger steamship company will increase its profit by reducing its overhead—that is, by building constantly larger cruisers, as the steamship companies have constantly increased the size of their passenger steamers.

This constant increase in the size of the air cruisers will tend to constantly reduce the cost of travel.

The gradual development of a demand for air-passenger travel will stimulate a demand for more and more profitable operating companies and these in turn will continuously increase the need for new machines and more pilots.

There will, of course, be innumerable other uses for the aerial cruisers than these specified here. For instance, for the immediate inspection of telephone and telegraph lines after destructive storms, for exploring, for finding persons or straying cattle or sheep in the wilderness or desert. Repairing tools and equipment and supplies can be readily carried. The air cruiser will of course find its usefulness in the proximity of lakes, rivers or other bodies of water sufficiently large to operate upon.

The hull of the Witteman-Lewis Air Cruiser is designed to have a displacement in sea water that will carry the entire machine with a draft of 10 inches at the deepest point. The water rudder provides easy steering afloat.

The large cruiser, having a higher horsepower, gives higher speed and greater safety and maintains its speed under adverse weather conditions. It can rise into the air with a ten-mile wind. Furthermore, the crew is larger and therefore

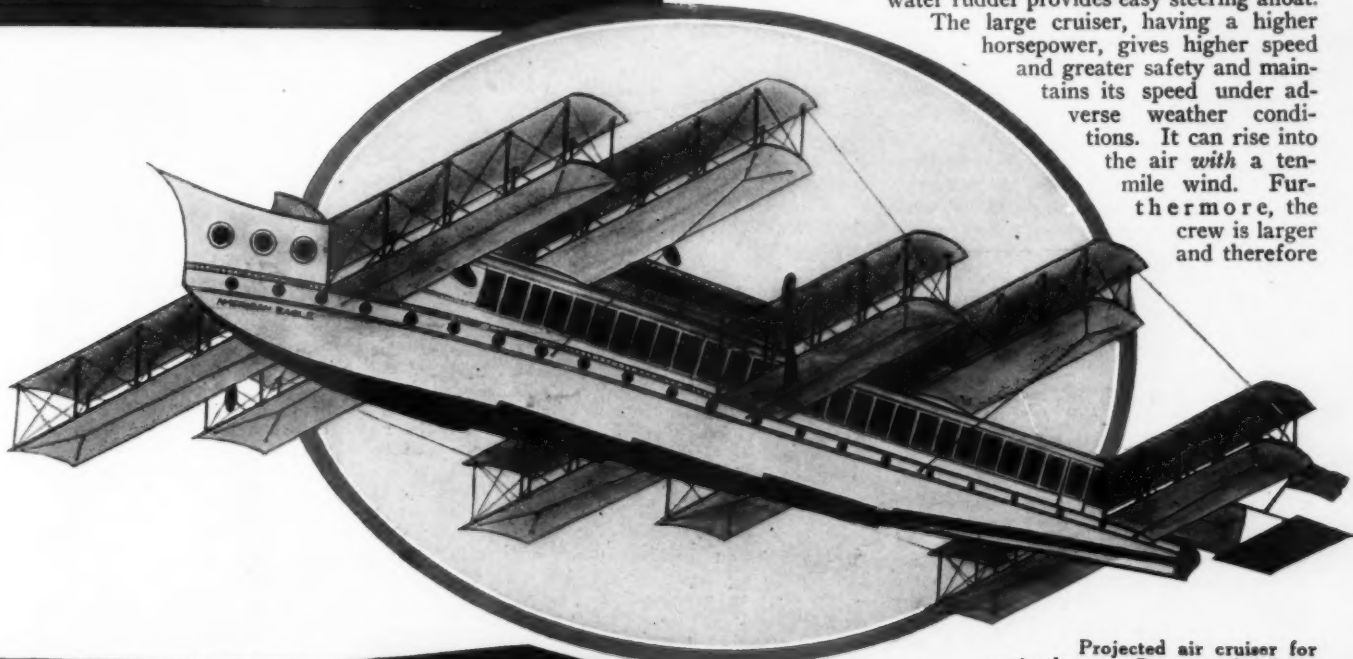
ABOUT 950 MILES.

MILES

WASHINGTON to ATLANTA  
ABOUT 550 MILES.

WASHINGTON

ATLANTA



Projected air cruiser for service between Boston and Atlanta



125-mile-an-hour French Spad. The large machine is one of a type which recently Rome, Otranto and Saloniki, and on its return it made a night trip of 640 miles

more reliable. Two pilots can take the controls alternately, each relieving the strain on the other. The observer, the mechanic and the helper can independently perform their respective functions which should no more be performed by one man in the air cruiser than aboard the cruiser at sea. Thus the efficiency of the crew is maintained during a flight of ten or more hours. And should one or even more men become sick or injured, the machine and the lives of its occupants would not necessarily be endangered.

The air cruiser can be completely equipped with all the means of sport to which the motor boatman is accustomed and can be comfortably or even luxuriously furnished.

It will undoubtedly be much employed by the future generation as the motor boat is now.

# When Invention Runs Riot

The Way Our Own Citizens Bomb the Government Authorities at Washington With Sure Devices for Putting the U-Boat and Hostile Airplane Out of Business

By C. H. Claudy

PERHAPS you have an idea that will win the war. Lots of fellows have such ideas—why not you? You sit down and reduce your idea to a letter. The letter you send to some one in Washington. If you are lucky you pick the "some one" who has to do with the kind of idea you have—that is, if it's an idea for a ship you send it to the Shipping Board, if it's an idea for a gun, you send it to Ordnance, if it's an idea for a flying machine, you send it to the Aviation Section of the Signal Corps or the Navy, and so on.

If you are lucky and do pick the right place to send it, you will probably have it acknowledged.

And then, one thousand bets of broom handles to bilge pumps, you never hear of it again.

It may be you feel you have a grievance. The real reason, however, that you don't hear any more about your idea, is either that it's an old idea, or that some one beat you to it, or that it won't work, or that there is an economic or strategic or other reason why it mustn't be used.

Thousands of inventors have sent in tens of thousands of old ideas. Knowing the "state of the art" as the patent attorney calls it is a regular man's job for almost any "art." When a broker or a car driver or a merchant or a tailor or a clergyman or a manufacturer eats mince pie and dreams of an invention to end the war, he seldom stops to think that maybe the fellows who have been working all their lives on inventions in this particular line have thought of just this thing before. Still less do we ever imagine that some one else may have just thought of it, and gotten it to Washington a week ahead of us. And as for the thing not working, or there being a reason why it must be used if it will work—what sort of an inventor is he who thinks of these things?

Fr'instance.

The U-boat is a nuisance. Everyone knows that. Its torpedo is the thing that makes it a nuisance. Every one knows that, too. Why not, then, argues the chap who patriotically wants to end the war, why not fix the torpedo so it can't hit a ship? Why not, indeed! What could be simpler than to surround a ship with a net some ten feet away, to keep the torpedo from striking it? Or, better yet, why not provide a curtain of water under pressure, which would deflect the onrushing torpedo from its mark? Let us, says the inventor, provide the ship with powerful pumps, and when we see a torpedo coming, let us use the ship's engines to squirt water down into the water, forming a curtain through which the torpedo cannot pass!

Fine—fine. Except for the facts that: (1) a ship hasn't engine power enough to make a curtain through which a one-ton torpedo won't penetrate at forty miles an hour and, (2) if it had, there wouldn't be time to get it going between the time the torpedo was sighted and the time it struck and; (3) if there was such a curtain and it could be worked in time, and the torpedo did hit it and was deflected, it would still explode and do about as much damage ten feet from the vessel's hull as if it hit it—apart from these things, this is a fine idea!

So is the idea of a net—only: (1) unless the net was steel the torpedo would go through it like a bullet through cheese cloth; (2) if it didn't go through it, and exploded at the net the same damage would be done and; (3) if all the mechanical problems of surrounding a ship with a net could be met, it would still slow up the ship's progress to a point where

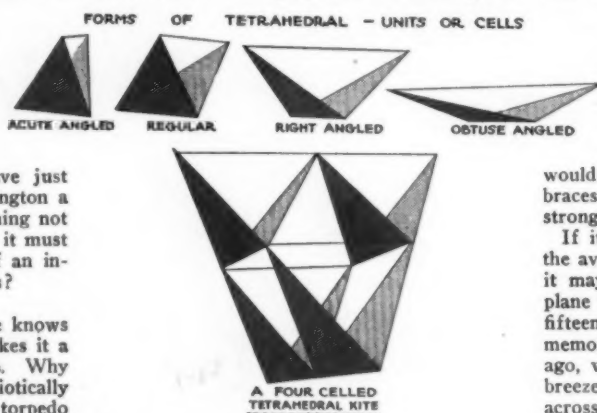
it would be uneconomic to use her at all!

These are examples. In the aeronautical field the suggestions are in many instances even more weird because the American public is, from an aviation standpoint, as yet almost entirely ignorant. We know that airplanes and flying boats fly, because we see them do it. We know Uncle Sam is building a few thousand as fast as he can, because we see it in the papers. But as to how these things fly, or where they are being made or how, or just what will be done with them after they are made, we know too little.

We know so little because it is considered that the less we know, the less Germany will find out, and the less she finds out, the worse she will be treated when we get in the air in quantity. Maybe so. Anyhow, the joyous result is a crop of "suggestions" and "inventions" and "discoveries" which gives impecunious scribes a chance for stories, like this one. So we should worry!

Fr'instance, again.

Mr. B'jones is a motor boatman. Before the war he had a 30-footer in which he went on camping expeditions, took his wife or some other fellow's wife for a spin and enjoyed life. He learned all about a gasoline motor, and looked with envy on the fellow who had a 40-footer or a flying boat. Naturally, he



also looked at the war through a binnacle and sees its end through either a marine or an aeronautical spy-glass. So he puts his wits to work and suggests to the Navy that a good way to end the U-boat menace will be to have a flying boat capable of flying at the same speed as a submarine. "I notice," he writes, "that the fastest machines which engage in aerial battle are the smallest, and that the big, weight-carrying machines which go slow, are large. Therefore, why not make a flying boat of such size that it can go at approximately the speed of a submarine? It could then follow along the wake of one and drop depth bombs upon it at pleasure. I should be glad to come to Washington at my own expense, to confer with you further along these lines if you would like to have me. Any bank or minister in my town will tell you of my responsibility, etc."

Now you can't blame a really busy officer in the airplane game from putting a letter like that carefully away in a filing case and forgetting it. It has to be filed, for that is the system. But it doesn't have to be discussed by people whose time is valuable. Of course, the officer doesn't blame poor B'jones. He knows B'jones is patriotic and well meaning. It's his misfortune to be ignorant of a few fundamentals of aviation.

The officer knows that the speed of any aeroplane is a combination of three factors—

power, weight, and surface. Of course, he knows the thousand details which modify speed—shape of surface, amount of surface exposed for wind resistance, shape and size of propeller, etc., but with all these factors at their best, surface which supports, weight which drags down, and power which pulls, alone determine speed. Obviously, the less the wing spread, the less the weight. But the less the wing spread, the greater the power must be, because the less the wing spread, the more need for speed to keep in the air. And the greater the power, the heavier the engine. The heavier the weight, the greater must be either speed or wing spread.

In this Chinese maze, this vicious circle, moves the airboat and airplane designer. With a practical maximum of something less than 200 miles an hour, and a practical minimum of about forty miles an hour in the air, his system of compromises is organized.

Now, if a machine of a certain weight and surface power goes forty miles an hour, "why," says the man in the street, "can't two of them be hooked together and reduce the speed necessary to float them to twenty miles an hour?"

And nature turns around and answers that there is only one form of wing surface which can, within reasonable limits, double the surface and the weight together. That is Dr.

Alexander Graham Bell's tetrahedral kite construction, which makes two tetrahedrons as strong as one, and weighing just twice one. But for another form of supporting surface construction, with increased size, the weight increases faster than the surface. Two airboats hitched together

would have to have a wonderful system of braces and brace wires to make the two as strong as one—which adds weight.

If it is ever possible to increase materially the available horsepower per pound of engine, it may be possible to make a man-carrying plane which will float through the air at ten, fifteen, and twenty miles an hour. With keen memories of the Wright flights of ten years ago, when to go up in a three-mile an hour breeze was an adventure, to fly five miles across country a stunt, to climb 500 feet in the air in five minutes meant a front page story and the first sustained flight of one solid hour took the whole first page—with memories of these timid first beginnings and to-day's wonderful aerial achievements, far be it from the present scribe to say no ten-mile an hour plane will ever be built. But if it is, it won't be according to known formulae of to-day or with the present type of engine—and the officers who receive B'jones well-meant suggestion smile patiently in that knowledge and pigeon-hole his letter.

Comes K'smith with another idea.

He puts it in the form of a catalog, probably because he thinks it's businesslike.

Navy Department,  
Washington, D. C.

Dear Sirs:

- (1) An airplane or airboat flies.
- (2) It flies with power from an engine.
- (3) Part of that power sustains it in the air.
- (4) The rest of the power propels it forward.

If (1) part of an engine's power can sustain a heavy airplane in the air;

Why (2) cannot all its power be put to sustaining, thus eliminating forward motion?

And if (1) hovering is thus possible, why (2) is not a slight forward motion, at low speed, possible?

If you wish me to come to Washington to help you in developing the helicopter idea according to the attached copyrighted sketches, I shall be pleased to do so at \$200 a month and expenses and a price to be agreed upon later when the Government accepts my idea.

Yours truly,  
K'SMITH.

K'smith, poor fellow, doesn't know that half the aerodynamical laboratories in the world are working on helicopter ideas. He also has failed to reflect on a few well-known facts. K'smith can ride a bicycle, perhaps at twenty-five miles an hour, and keep it up for an hour. He can ride five minutes up a ten per cent grade. In the hour he has transported 200

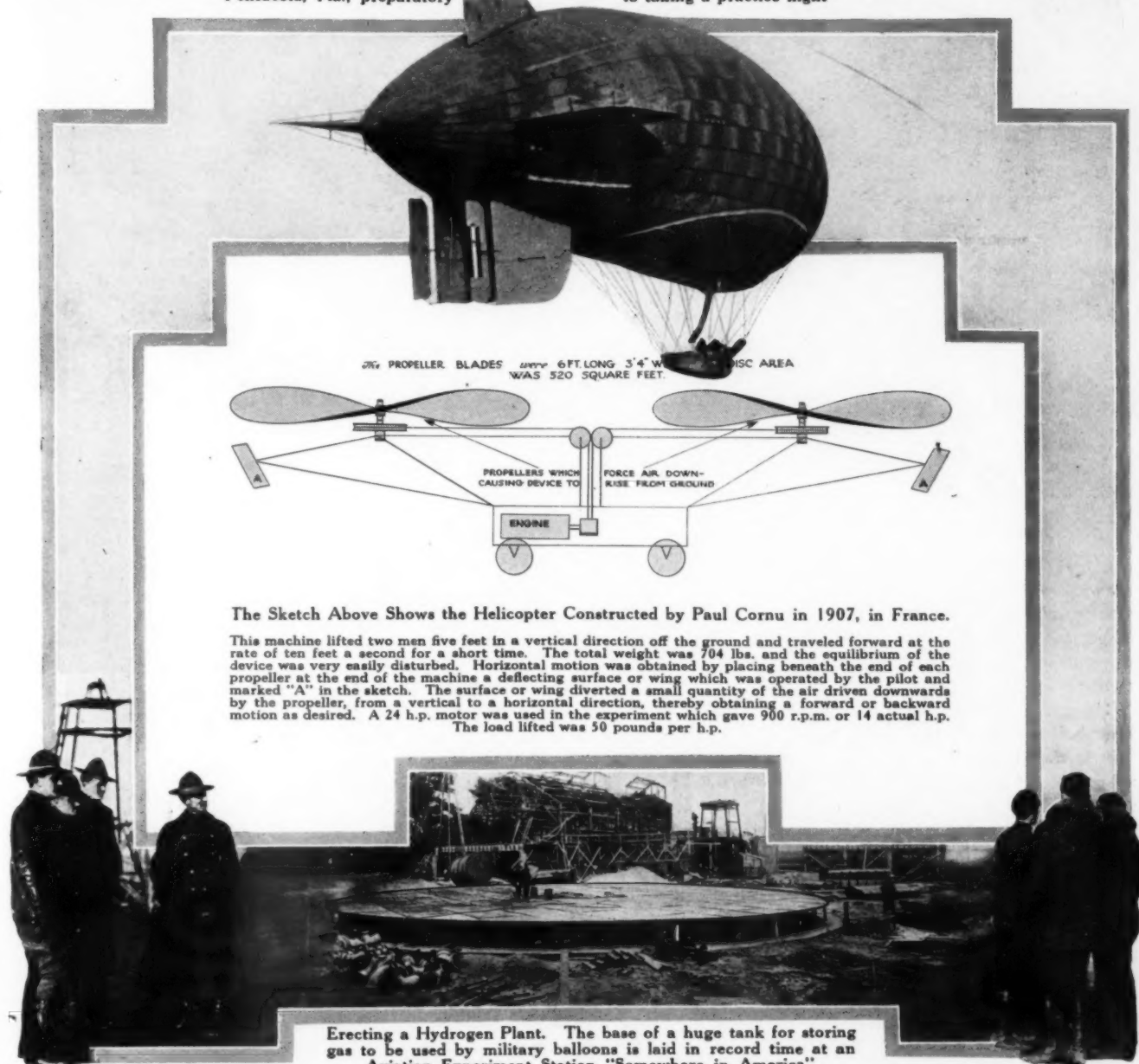
The engine power which drives an airboat into the air distributes the weight of the plane over a vast surface of air as the airboat glides through the supporting medium, on much the same principle that a skater at speed can negotiate half-inch ice on which he has only to stop to break through. That same engine power, beating into one unit surface of air, accomplishes nothing. No helicopter yet devised has managed to raise itself off the ground and carry a man, nor does it seem at all likely that it will, until horsepower per pound of engine increases decidedly.

Nevertheless and notwithstanding, horizontal propellers in combination with vertical tractor propellers do offer a fascinating field for the inventor, and the idea is being taken very seriously in many a laboratory. Un-

the country come out strong—regular battalions of them. Maybe squadrons is more ambitiously nautical a word! Anyway, he does know the war ought to be fought in the air. At least a thousand of him have suggested one and the same plan to various government officials, from the private secretary of the second assistant chief clerk to the janitor of the Fish Commission to the President himself.

These suggestions are worded in 1,000 different ways and the suggestors want 1,000 different varieties of rewards, running all the way from a new star in the flag to a million dollars. But the suggestions are centered around the fact that all that is necessary to squelch the U-boat in its lair is to have enough seaplanes and mother ships to "guard the

Leaving the hangar. The "Blimp" dirigible, of the non-rigid type, is leaving its hangar at the Naval Aviation Station at Warrington Beach, Pensacola, Fla., preparatory to taking a practice flight



The Sketch Above Shows the Helicopter Constructed by Paul Cornu in 1907, in France.

This machine lifted two men five feet in a vertical direction off the ground and traveled forward at the rate of ten feet a second for a short time. The total weight was 704 lbs. and the equilibrium of the device was very easily disturbed. Horizontal motion was obtained by placing beneath the end of each propeller at the end of the machine a deflecting surface or wing which was operated by the pilot and marked "A" in the sketch. The surface or wing diverted a small quantity of the air driven downwards by the propeller, from a vertical to a horizontal direction, thereby obtaining a forward or backward motion as desired. A 24 h.p. motor was used in the experiment which gave 900 r.p.m. or 14 actual h.p. The load lifted was 50 pounds per h.p.

Erecting a Hydrogen Plant. The base of a huge tank for storing gas to be used by military balloons is laid in record time at an Aviation Experiment Station "Somewhere in America"

Photograph Copyright by Committee on Public Information

pounds twenty-five miles, laterally. But when he tries to transport the same 200 pounds, with the same power, up, against the action of gravity, he finds he can't do it! Railroad trains rush around the landscape at sixty miles an hour, but your mightiest passenger locomotive lies down and dies a natural death on a three or four per cent. grade. Keeping even with gravity is one thing—working against it something else already.

doubtedly some one will some day discover how to make an airplane hover under its own power, but it can't be done by a syllogistic suggestion and K'smith can take that as the perfectly good reason why his idea doesn't meet with a delegation from the President come to fetch him to Washington!

When it comes to aerial tactics and strategy, particularly for the Naval branch of airplane work, the B'joneses and the K'smithses of

water route to Europe."

"Let us provide 300 mother ships," says K'smith B'jones, "and anchor them at ten-mile intervals across the Atlantic. Every mother ship will have two or more seaplanes. These seaplanes will fly constantly back and forth from mother ship to mother ship. Transports will travel within a short distance of these mother ships, which will at once guide

(Continued on page 56)



## Spring Part II

**A**FTER the boat has been scraped, painted, and varnished from stem to stern and keel to masthead, the motor overhauled and cabin set to rights, the next thing is to get her into the water. This is accomplished in various ways, depending mostly upon local conditions and the equipment at hand.

There are a few things, however, that should be looked after before the launching. Has a plug been put in the drain hole in the bilge? More than one boat has been put over in a hurry to catch the tide and this little—though mighty important—detail has been forgotten, much to the disgust and disappointment of the owner. It usually means some hustling to get her out again, to say nothing of a bilge full of water and a lot of equipment to be dried out.

It is well to make the plug of dry white pine, drive it in tight, and then saw it off flush with the planking. A pine plug that has had a coating of white lead before driving will swell after a few hours in the water and be as tight and firm as part of the planking itself.

Another thing that is apt to be slighted in the rush of the last few hours' work is the stuffing box. It is just as important that the packing is tight as to plug the drain hole. If you don't want to haul your boat out after the first trip it is a good plan to repack the stuffing box before the launching. For this purpose about the most satisfactory material is square-braided hydraulic packing of a size to fit the gland.

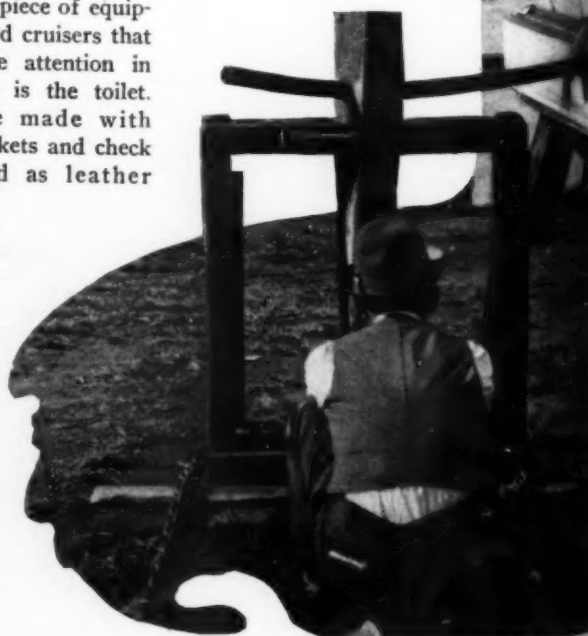
Some men prefer to cut the packing into short lengths that will form rings about the shaft, but just as good results are obtained by using about four turns wound in a spiral in the same direction as the gland turns when being tightened up, but with the ends cut to a taper and overlapping so that there will be four thicknesses at all points about the shaft.

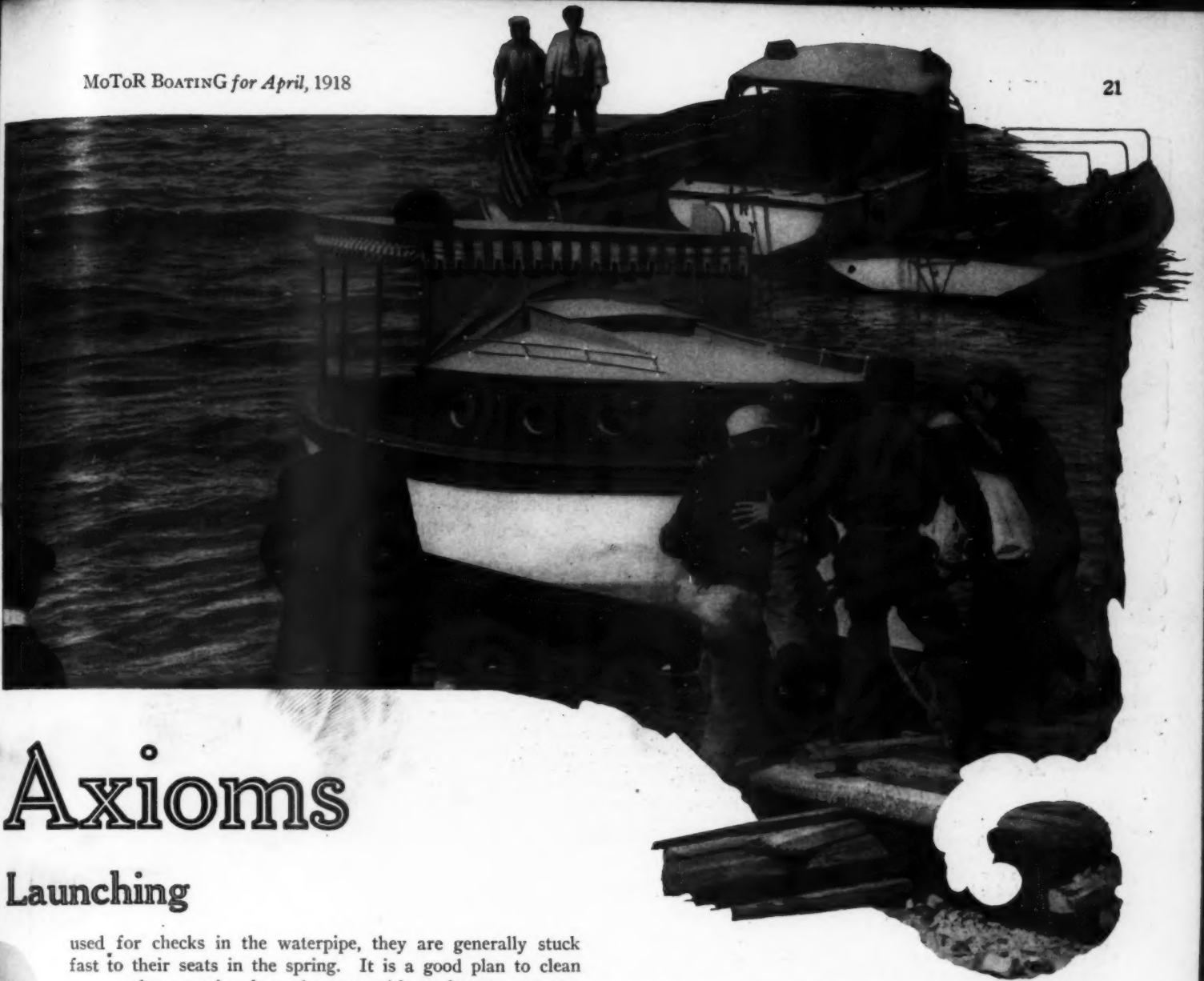
When a wheel is slightly out of balance or the shaft is

worn the packing invariably wears out rapidly. This condition can be helped to a great extent by putting three or four carefully fitted rawhide washers in the box with the usual packing.

The friction of the packing on the shaft can be somewhat reduced by thoroughly mixing flake graphite with grease and rubbing the mixture into the packing. It does no harm to put some of it between each layer of packing.

Another piece of equipment aboard cruisers that needs some attention in the spring is the toilet. Some are made with leather gaskets and check valves, and as leather dries out a n d shrinks, s o m e t i m e s e v e n cracks, the pump a n d valves should be given a little attention. W h e n rubber balls are





# g Axioms

## t II Launching

used for checks in the waterpipe, they are generally stuck fast to their seats in the spring. It is a good plan to clean the corrosion from the seats with sandpaper or emery cloth and put in new balls.

To avoid any chance of a leak it is a pretty good scheme to examine all the water and drain connections through the hull. Although the fittings are bronze they have been known to corrode to such an extent as to break off at the planking from the least movement or vibration.

When the boat is hauled out in a ship yard or on the grounds of a yacht club with a marine railway the launching is a simple matter once the craft is on the car. It is the man who has

his boat up on the bank and no elaborate mechanical equipment at hand that needs all the help h i s friends can give him.

I t i s h a r d work and

trying to the old-timer, little less the amateur, to move a boat weighing several tons with nothing to help but a few planks and some pipe rollers. If the rise and fall of the tide amounts to four or five feet it is comparatively easy going to work the boat down the beach at low water and let the rising tide do the rest.

The man who has to use his head as well as his hands is the one who must launch his boat from the bank at high water. It is then a case of getting the boat to the top of the incline, making sure that everything is ready, and trusting to luck that your skids and sliders work as intended.

It costs a little more for material, but when a boat must be handled by inexperienced men, a substantial timber cradle is the best possible insurance against accident. It should have long heavy stringers that will carry the weight to the rollers or greased sliders without bending. The cross frames should fit the hull snugly and be well-braced fore and aft. It is practically impossible to upset a boat when such a rig is used.

For moving a boat on land there is nothing simpler and more effective than rollers. They may be either of wood or iron pipe, but the larger the better. In using them plank runways must be laid, and to have them work properly the runways must be fairly level and smooth.

In shipyards where boats are being moved every day and a power winch is available, greased skids and sliders can be used with good results. When once in motion the pull required is no more than with rollers, but the force necessary to start is considerably more.

The day of the old hand-powered capstan or the home-made crab has about passed. They answered the purpose all right in the days of sail boats, but the motor boatman knows

(Continued on page 92)





## Florida Opens the

A Three Days' Meet at Miami Which Attracts a Good Compete—An Indication of the Popularity

By R. W.

Commodore Charles W. Kotcher (on the right) who as yet has never missed a Miami Regatta, and Dr. Lyons, owner of the Scripps-powered cruiser Regina

Stroller, an Albany-built runabout which is now beginning her fourth racing season. She is powered with a Van Blerck motor

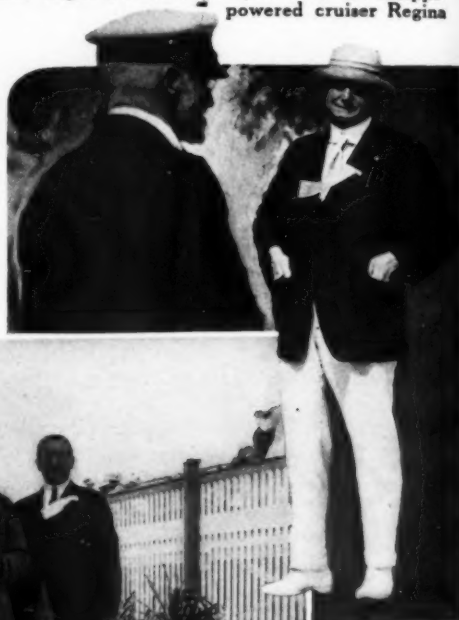
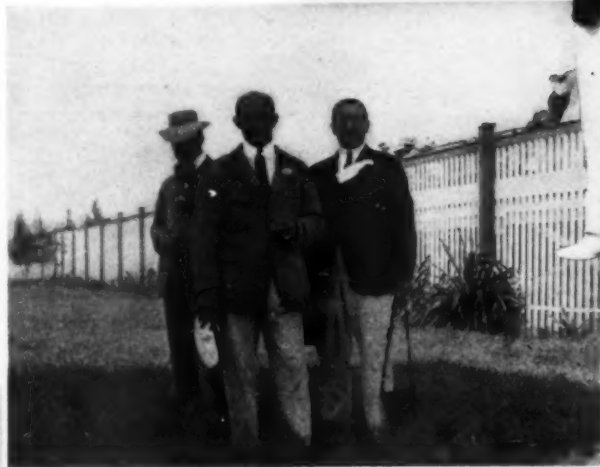
**M**AN must have excitement, or at least he thinks he must. Thousands upon thousands

of people went South to Florida this winter, partly to dodge our delightful Northern winter and partly to dodge hearing "War, War, War," morning, noon, and night. When they got down there they needed something to do. By tacit consent the war was not discussed. Everybody down there was there for a good time, for a rest and a change. So the regular routine of the Southern winter resorts went along. People danced, played tennis, golf, swam, flirted, took automobile tours, just as they have done in previous years. The Miami Chamber of Commerce, seeing that the people just wanted to be natural and to enjoy themselves in a perfectly natural way, decided to hold the Miami Regatta as usual, so they went ahead and fixed things up and on February 27 and 28 pulled off a very successful regatta, fully as successful as any previous Southern Regatta, and better attended than any previous event of its kind in the South. The net proceeds were donated to the American Red Cross and a sum slightly in excess of \$2,000 was turned over by the Miami Chamber of Commerce to the Red Cross as a result of the event. Rather a remarkable happening—to actually make a regatta produce more dollars than was spent on it.

The racing itself was good, especially on the second day. The first day had too many events listed, for several of which it was found impossible to get enough entries to make the races interesting. It is an accepted fact that the public is not interested in slow boats; what they want to see is speed and then some more speed. The Open Displacement Boat Race was the big event of both days. Three boats out of the five entered were very closely matched on paper and so proved to be in actual racing. Wizard, a 32-foot Lawley boat owned by Mrs. Carl G. Fisher, was a favorite. Wizard originally had a six-cylinder Wisconsin engine; she now has a six-cylinder 5¾ by 7-

inch Speedway and is credited with well over 30 m.p.h. Stroller, the five-year-old Albany fast runabout owned by E. C. Romfh, president of the First National Bank of Miami, powered with a six-cylinder Van Blerck, was admittedly fast, but her age apparently put her out of the running. Hoosier II, the 35-foot Albany fast runabout owned by H. R. Duckwall, of Indianapolis, and powered with an eight-cylinder Sterling, was touted to have enough speed up her sleeve to show her stern to them all. The first day four boats got

John Oliver La Gorce, associate editor of the National Geographic Magazine; Carl G. Fisher, promoter of the Miami races, and James A. Allison



Finish of one round of the racer class on the second day of racing

# Racing Season of 1918

Entry List—Runabouts and Express Cruisers of These Types of Craft at Present

**Wadman**

Rex Wadman, whose ability to put things across is responsible for the success of this year's races

Hoosier II, a Sterling-powered runabout, making one of the turns

away in a bunch, the fourth being Comet, a 28-footer with a four-cylinder Sterling. Right from the start Hoosier II, with Mr. Duckwall at the wheel, took the lead and held it until the end of the race. The race was between Wizard, driven by Carl G. Fisher, and Stroller, driven by Bill Webber, which was eventually settled in favor of Wizard. This gave Hoosier II first place, Wizard second place, and Stroller third place for the day.

On the second day these same three boats came up to the line with blood in their eyes.

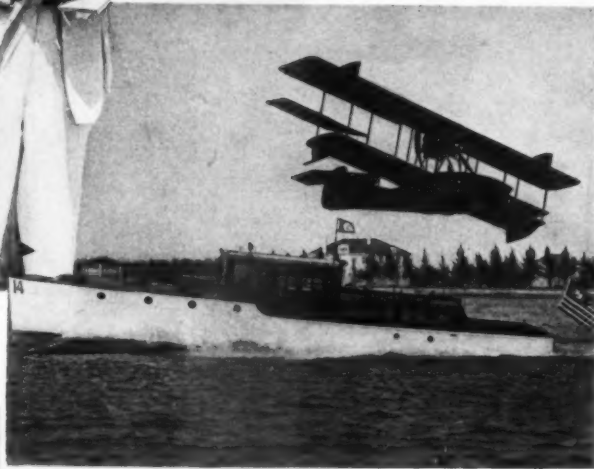
The start was a good one, with Carl Fisher slightly in the lead. At the first upper turn they were all bunched, but Carl Fisher cut the buoys a little finer and nosed around the turn a boat length to the good, but in the straightaway Stroller fooled them all by shooting into the lead. This made the race faster and more furious; both Mr. Fisher and Mr. Duckwall let out a couple of notches and started after Stroller. As they came up by the judges stand the three boats were so close together that it kept the timers on the hop to catch them, but Stroller had found a couple of hundred extra revolutions and maintained just enough of a lead to throw a pretty wake for the other two boats to wallow in. Hoosier II and Wizard were right on Stroller's tail, sometimes one ahead and then the other, but the race finished with Stroller well ahead, Hoosier II next and Wizard third. If Wizard had won second place and Hoosier II third place, all three boats would have tied for the series with 8 points apiece; as it was Hoosier II got 9 points, Stroller received 8 points, and Wizard landed 7 points, with Jan II getting 2 and Comet getting 2 points apiece.

The race put up by Stroller on that second day was a wonder. Here was a boat built by the Albany Boat Corporation away back in 1913 for Percy Reddick, raced by him and run by him for three seasons, then sold to T. E. Powers, of Red Bank, and raced and run by him up North in 1916 and at Miami in 1917, then sold to E. C. Romfh and used continually by him since.

The match race between the two Shadows was a surprise. Shadow III, last year's winner, then owned by Carl G. Fisher, now in Sectional Patrol Service with the Naval Reserve, a 50-footer powered with a pair of eight-cylinder Speedways, went out and deliberately trimmed Carl Fisher's new creation, Shadow V, a 45-footer with a duplicate power plant; not only trimmed him the first day, but also repeated the performance on the second day. Shadow III was driven to victory both days of the regatta by her own crew of Jackies.

Commodore Kotcher's Betty M III has a brush with a Curtiss Flying Boat

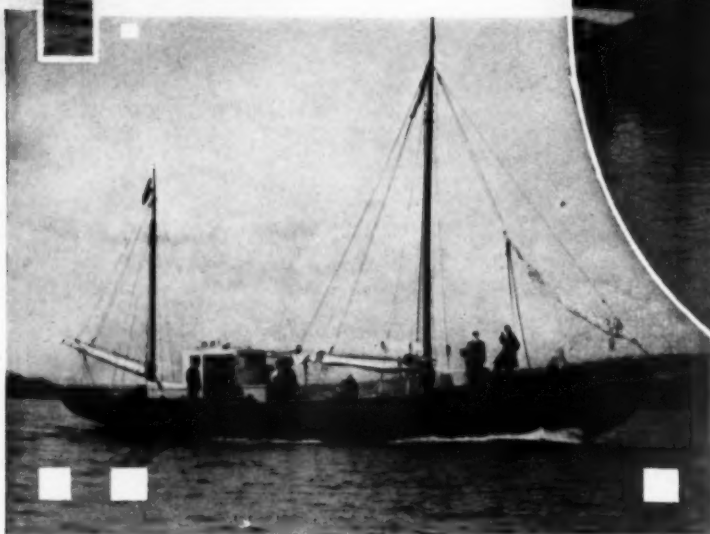
Photographs copyrighted by R. W. Wadman.



at Miami. Wizard leading, Hoosier II, second, and Jan II, third



A gill netting motor boat, typical of several thousand in the Pacific salmon industry



Motor ketch used in herring fisheries, Alaska

FROM the northernmost point in Alaska to the Mexican line, following the contour of the Pacific side of the continent, is approximately 5,000 miles. That you may sense this distance more accurately, try to realize the distance from New York to San Francisco, and multiply it by two. This Pacific coast line proper, carrying in to thousands of indentations, harbors, inlets, and bays, runs several times 5,000 miles.

On this Pacific side of the United States and Canada, and plying every foot of this tremendous coast line, is a fleet of commercial motor boats far greater than will be found any place else in the whole wide world. And this fleet has been remarkably developed as to type, construction and efficiency. To the layman, the large number of these commercial motor craft is the startling feature. To the technical man, who knows motor boats, the one outstanding feature is the splendid design of most of these boats and the high standard of mechanical perfection attained in building and operating them.

There is much that goes on west of the Cascades and the Sierras that is little credited in the east. Your average easterner is prone to call it "western boasting" and dismiss it with a laugh and a shrug of the shoulders. For some tales that come out of the west this is sufficient acknowledgement. But the easterner who discounts the true tale of this western commercial motor boat fleet is merely displaying his own provincialism. There was a time when eastern motor and accessory manufacturers would not see the tremendous busi-

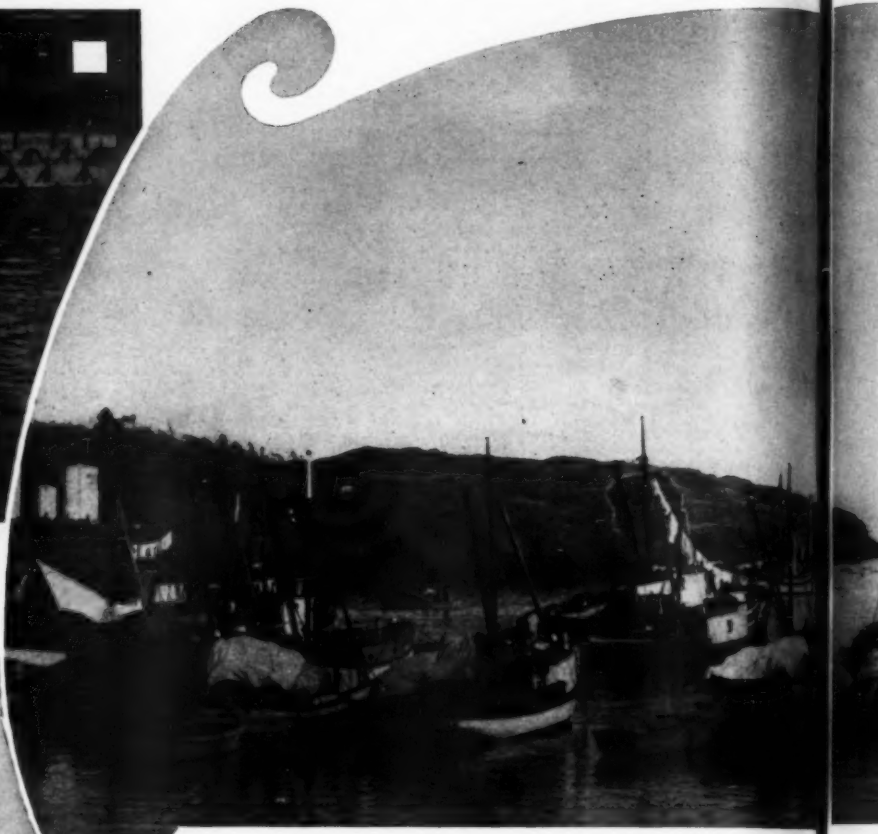
ness possibilities on the Pacific Coast. That time has passed.

To understand the reasons for the development of this wonderful fleet it is first necessary to understand something of the country, its resources, its transportation problems and its transportation facilities.

The fisheries of the Pacific Coast stand first in the development of the fleet, naturally, yet this is but one of the causes. There is hardly a business of magnitude on the coast that does not somewhere employ motor craft in its daily work. A glance at a map will show that water transportation is possible almost everywhere on the coast and part way inland. And the impossibility of building railroads through much of the coast country that is now served by waterways will always leave the motor boat as a prime factor in transportation of both passengers and freight.

Look closely at a map of the Puget Sound country, and all the inland waterways from there to Alaska. Look at the bays and the rivers of Oregon and California. And looking at all these, and realizing the character of the country and of its many resources, one will readily see why the motor boat has come into its own on the Pacific Coast.

Two other big contributing causes must not be overlooked. First, that there has been manufactured in the San Francisco district for



A fleet of motor purse seining boats in harbor, waiting

## The Need for Com

The First of a Series of Articles De  
Various Types of Commercial

I. THE PACIFIC

By A. V.

Undoubtedly the motor boat is playing a more important part the internal combustion motor which is supplying power to the thousands more clear of U-boats every hour. The motor ship of to-day is steamship ever was. The commercial motor boat can and soon will resources that railroad and freight congestion in the future will be waterways and canals will bring about a system of water transportation. To-day the commercial motor boat is in a state of undevelopment. few logical reasons for this lack of development other than failure one at this moment.

MoToR Boating has planned a series of intensive articles on the power plant of which this is the first. All of the articles will be the actual conditions and requirements are and just where the

On the Pacific Coast they have been making use of commercial for every 1,000 people living in the Pacific states. On the eastern more, on the Pacific about thirteen out of these fourteen are complete craft to one commercial. For this reason the first several idea in mind of teaching the East what the West is doing in this

many years a type of marine motor of the ruggedest kind, that any squarehead can run successfully with very little teaching, and that has proved absolutely reliable in the hardest kind of service. And secondly, distillate, a fuel almost like kerosene, has been furnished in abundance to run these engines at a cost of six to nine cents a gallon, cutting the power cost down to a minimum. And the Standard Oil Company has so distributed marine filling stations that from San Diego to Ketchikan motor boats may now fill their fuel tanks at those stations easier than motor cars are filled at the usual city filling stations.

The story of the development of the Pacific coast fleet of commercial motor boats would not be complete without mention of the naval architects who have contributed so much that has been vital to that full development.

In Seattle, Lee & Brinton and L. H. Coolidge were pioneers, and later L. E. (Ted) Geary, Edson B. Schock and Martin C. Erisman did their part. In Portland there was



for salmon run. A typical scene during the fishing season

## Commercial Motor Boats

along with the Development of the Craft and Their Power Plants

FISHING BOAT

Comings

toward winning the war than any of the automotive vehicles. It is sands of patrol boats and submarine chasers which are sweeping the as important to the nation's economic welfare as the ocean-going become such a strong factor among the country's transportation unknown. The federal development and ownership of all the inland tion which it will be impossible to choke. The surface of its possibilities has hardly been scratched. There are to take advantage of the opportunities which still stand before every

subject of the development of the commercial motor boat and its written by men in the field, those who know from experience what greatest opportunity exists. motor boats for years. Out there there are fourteen motor boats seaboard we have only four boats per 1,000 population. Further- merical craft whereas on the Atlantic there are perhaps ninety-nine articles in the series will deal with Pacific Coast activities with the field.—Editor.

W. H. Curtis, and in San Francisco the Dickey Brothers turned out many excellent motor craft. Others there were who had lesser part in this development.

To these naval architects, notably the Seattle group, is due much of the high efficiency of the modern motor fleet on this coast, and their service in applying to the design and construction of this fleet the best in modern marine practise is of incalculable value. They accepted what actual service had proven best for each type, added many ideas that proved equally good, and evolved motor boats that for grace of design, high efficiency in actual service, and general all 'round excellence are without a peer in any part of the world. I personally know of the many difficulties they encountered, yet they held steadfastly to all that was good in their profession, and it would be denying the truth to say that the fleet as a whole does not show markedly the influence of their work.

I will not, in this article, consider in detail

years six absolutely distinct types of motor fishing vessels. To one familiar with the coast fisheries, from Unimak Pass to Mexico, each of these types is recognized on sight, and a glance at the boat will identify it at once as to home waters, the work it is engaged in, etc.

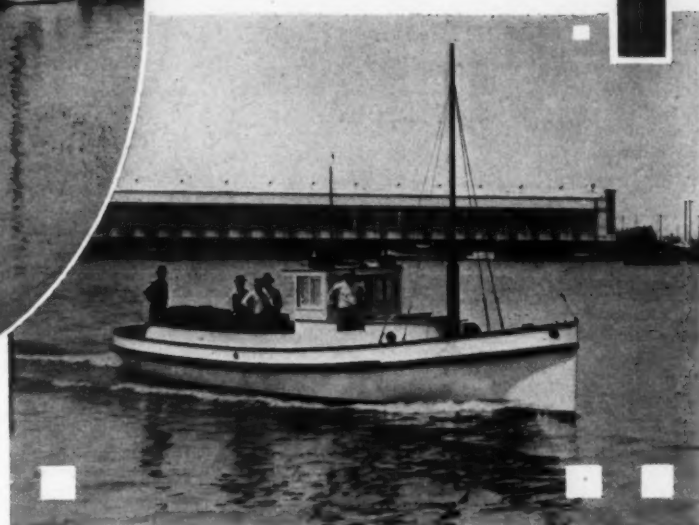
The salmon fisheries of the Pacific northwest are responsible for the development of three of these types, each of which is a logical result of the work required of it. A fourth type is now in process of evolution, but of that more later.

The halibut fisheries of the northwestern and Alaskan coasts have developed a type very distinct from eastern craft engaged in similar work.

On San Francisco Bay and its many tributaries will be found a small motor fishing boat of a type found nowhere else on the coast, and from Los Angeles north through Santa Barbara Channel and south to Lower California, will be found the tuna fisherman, a type that



A small, distinctive type of motor fishing boat found only in the San Francisco district



Fujisan, a typical tuna fisherman of the latest type

more than the motor craft used in the fisheries of the Pacific Coast. These constitute a wonderful fleet in themselves, and other types of commercial motor boats I will describe in detail in future issues of MoToR BOATING.

The tremendous fisheries of the Pacific Coast of the United States have developed within the last ten

has been developed only within the last four or five years, and that has already reached a standard design meeting every requirement of this comparatively new and growing industry.

I have been particularly fortunate in living on the coast during the greatest period of development in the motor fishing industry, and to me it has proved a very fascinating chapter in commercial motor boat history. To watch the steady growth of the immense fleets, each final type gradually emerging from the non-descripts of the earlier days, has been much like watching the dramatic revealment of some great sea epic.

Of all the motor fishing craft on the Pacific Coast, the purse seiner of Pacific northwestern waters has nearest approached absolute standardization. I have been amused, in a way, in looking over magazine articles and press dispatches in the last few months telling of the "standardization" of everything from destroyers to scout cruisers, for the magazines, almost without exception, have laid particular stress upon this as something new, something yet to be proved out under actual working conditions. A certain manufacturer, on a large scale, of a very excellent small automobile, has received columns of press notices because he has started the manufacture of a standardized type of submarine chaser for the government in his Detroit factories.

Yet I could lead all these enthusiasts on "standardization" to a boat building plant in Old Town, Tacoma, where standardization in boat building has been practised for 10, these several years back, and where they would find

motor purse seiners in every stage of construction from naked keel to finished craft sliding down the ways. The two Barbare brothers, Nick and George, have been successfully building seine boats to standardized plans for several years. They have a crew of workers who know every operation on every part of their standardized purse seine boats, and the result is that these craft are turned out from this yard so fast that the old timers on the Sound can hardly believe their eyes as they see the new ones slip into the water every few days during the rush season.

I do not mean by this that the Barbare brothers are the only builders who turn out first class seine boats on the Sound. There are many other yards that have turned out mighty good boats, the Skansis, at Gig Harbor, for instance, and John Wilson, in Seattle, and Nelsen and Kelez, and Jimmy Hall, and others in this same district, and Martinovich, at Quartermaster Harbor. Seine boats of this type are standard anywhere on Puget Sound, and any first class boat builder can build one, and it will be a real boat, too, you may be certain.

It was not so many years ago, ten, at the outside, that motor purse seiners were a novelty in north Pacific waters. Then the old "Pioneer" hove in sight with a little 'Frisco Standard engine below decks, and the old timers who had been used to sail as a motive power began to sit up and take notice. It wasn't long before the engine builders were swamped with

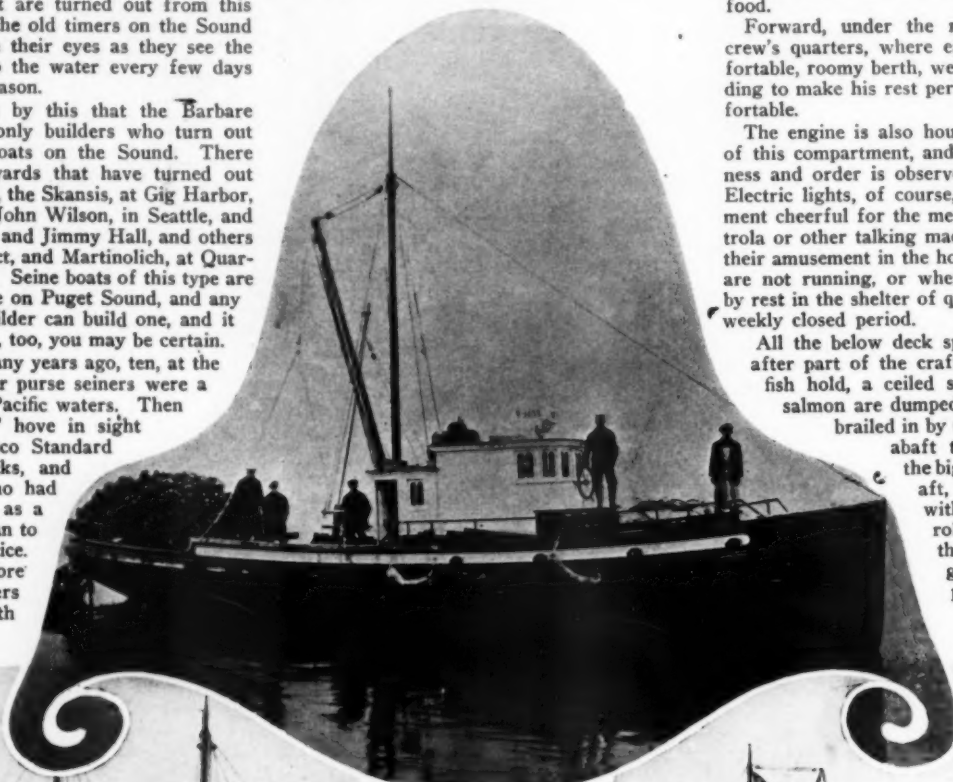
modern purse seine salmon fisherman could be selected than Active, built by the Barbare brothers and owned by the Rokas & Comas Grocery Co., of Tacoma. Active is 65 feet in length, with the generous beam of 15 feet and draws approximately 6 feet of water when loaded with her shining cargo of salmon.

the outside steering wheel used only when maneuvering with the net spread overside. Within is the wheel used by the helmsmen on the long runs, and the captain's berth and accommodations. Aft of the wheel-house is the galley, where the "doctor" holds forth with his seductive concoctions. And right here let me state that these fishermen eat the best of food.

Forward, under the raised deck, are the crew's quarters, where each man has a comfortable, roomy berth, well equipped with bedding to make his rest periods completely comfortable.

The engine is also housed in the after end of this compartment, and the strictest cleanliness and order is observed in this forecabin. Electric lights, of course, make this compartment cheerful for the men, and usually a Victrola or other talking machine, is installed for their amusement in the hours when the salmon are not running, or when labor is succeeded by rest in the shelter of quiet harbors over the weekly closed period.

All the below deck space available in the after part of the craft is taken up by the fish hold, a ceiled space into which the salmon are dumped as fast as they are brailled in by the power winch just abaft the mast, turned by the big motor below. Away aft, on a huge turntable with an easily working roller on one edge, is the immense net that gathers in the salmon, piled coil on coil, ready to be paid



Active, a motor purse seining boat used in salmon fishing

Foredeck of motor halibut schooner, showing windlass for handling heavy ground tackle. Run by main motor below



Tyee, a typical motor halibut schooner of larger type



Lumni, a motor cannery tender of the best type

orders for motors, but the seine boats didn't run to any particular type.

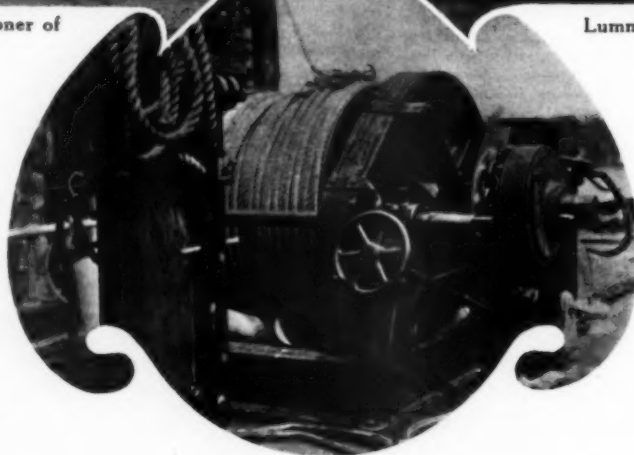
Then came the raised-deck pleasure cruiser, and I believe it was that wise old pioneer, "Dad" Starrett, of Seattle, who first adapted the pleasure cruiser accommodation plan to the purse seiner in his "Fredelia I." Others followed suit, and out of this beginning has evolved the present day type of motor purse seiner, of which there are hundreds plying Oregon, Puget Sound, and Alaska waters. These craft cost an average of \$6,000 each, so it is easy to see that the investment in a motor purse seiner reaches a very considerable sum.

In the old days the fishermen lived in tents on land near the fishing grounds, with all the disadvantages of that mode of living. With the coming of motors, and the present type of boats, they have moved into almost luxurious forecabin, with electric lights and other conveniences, and live like sportsmen out for a good time.

No better example of the very last word in

Her power is a 55 h.p. Imperial motor, of the heavy-duty, 'Frisco-built type that has made the Pacific Coast fishery craft famous the world over wherever motor boats are known and talked of.

A glance at the picture herewith will show the outstanding features of this type of fish boat. There is the pilot house, always found on north Pacific motor craft of all types, and



out astern over the roller on the first signs of a school of the "silver horde." These nets are of the finest linen twine, or of the best cotton, and in the Puget Sound district measure as great as 600 fathoms long and 80 feet deep. Floated by cork floats on the upper edge, they are fitted with iron rings on the lower, and through these rings passes a manilla rope which is drawn in once the fish are encircled. The result is that the fish are absolutely pursued by the net around and beneath them, and may be brailled out at the fishermen's leisure, with the big brail that looks like a glorified dip net, and which is hoisted overside by the power winch aboard the purse seiner.

The net always goes out over the stern, the turntable resting with the roller aft when in its normal position. A fisherman in a skiff handles the outer end, and the motor craft describes a large circle till the inner end of the net is brought to the fisherman in the skiff. Later, when the fish are brailled aboard and

(Continued on page 60)



### No. 3, Hike You, a 20-Foot Skimmer

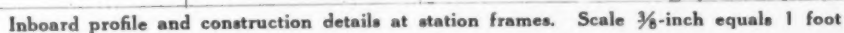
*By Philip L. Rhodes*

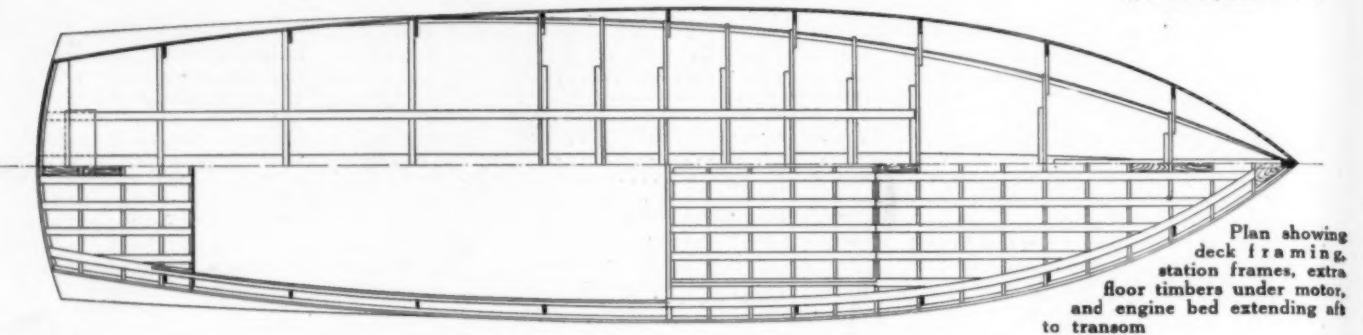
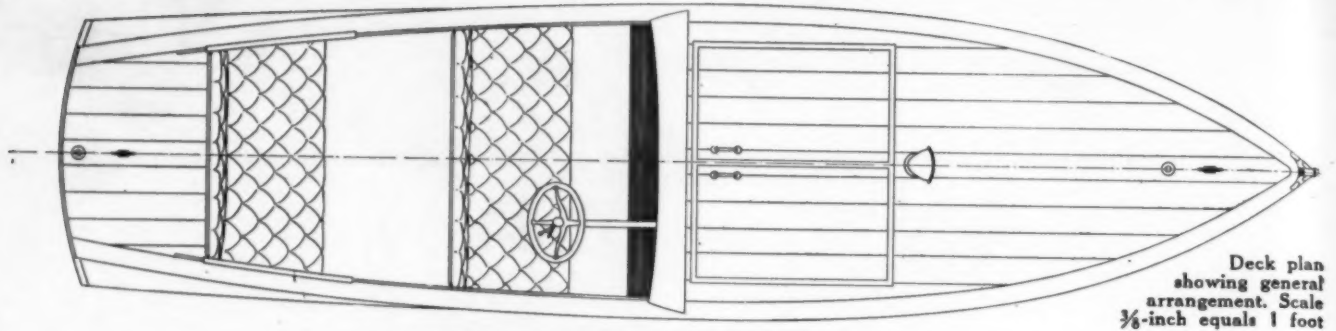
There are all sorts of runabouts and as many supporters; some prefer the orthodox round-bottom, while others swear by the more recently developed V-bottom. I am not going to dwell upon the merits of these two types, but will leave it to the accompanying drawings to voice my opinions and preferences. They

Length, Over All	20 Ft.
Beam, Moulded	5 Ft.
Draft of Hull	8½ Ins.
Displacement	1490 Lbs.
C. B. Above Base Line	22.66 Ins.
C. B. Aft of Amidship	1.327 Ft.
Transverse B. M.	4.92 Ft.
Longitudinal B. M.	79.2 Ft.
Area Load Water Plane	73.7 Sq. Ft.
Area Midship Section (Immersed)	1.68 Sq. Ft.
Moment to Change Trim 1 Inch	492 Ft. Lbs.
Pounds Per Inch Immersion	393.3
Block Coefficient	.319
Prismatic Coefficient	.692
Midsection Coefficient	.462
Waterline Coefficient	.739
C. G. of V. L. Aft of Midship	1.724 Ft.

Designs and descriptions may be submitted any time up to May 15, 1918, but we would suggest that they be sent in as soon as possible. Remember, you have a better chance of having your Ideal Runabout plans published if you submit them before the rush at the close of the series.

Due to sitting in cramped positions, if you would improve upon my little boat by adding a one-man top, equipped with side curtains, etc. (*sans* wrinkles), it would make her that much more comfortable and, if properly designed, would perhaps be an asset to





her looks. When Hike You is built I shall include in her specifications just such a top.

Just a few words in regard to the construction details may not be out of place here. In a boat of this size weight is an important factor, but must not be sacrificed for the sake of speed if the craft is to be really successful.

Boats of this type that skim over the surface of the water must have a strongly-framed and planked underbody to withstand the pressure of the water, to say

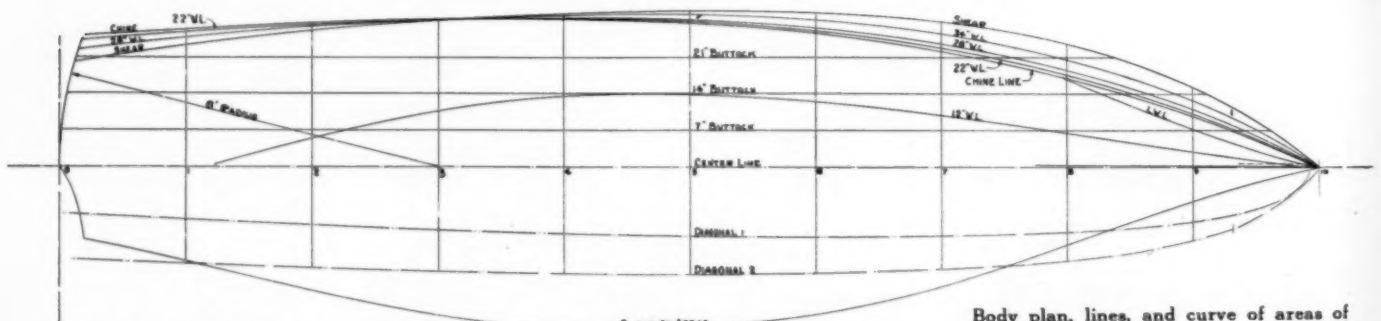
TABLE OF OFFSETS																							
STATION	HALF BREADTHS							HEIGHTS ABOVE BASE							DIAGONALS		STATION						
	SHEAR	CHINE	12" WL	16" WL	22" WL	26" WL	34" WL	KEEL	CHINE	SHEAR	12" BUTT	16" BUTT	22" BUTT	26" BUTT	34" BUTT	1		2					
0	1-7-5	2-1-0			2-0-7	2-0-0	1-10-1		1-1-4	1-2-1	2-8-0	2-10-0	1-1-7	1-8-4	1-2-1	0-8-7	1-5-5	0					
1	1-11-4	2-2-4			2-2-5	2-1-7	2-1-0		1-0-2	1-1-6	2-9-2	2-11-5	1-1-0	1-1-4	1-1-6	0-11-0	1-6-3	1					
2	2-2-2	2-3-6	0-5-5		2-3-4	2-3-3	2-3-1		0-11-0	1-1-5	2-10-3	2-11-1	1-0-1	1-0-7	1-1-3	0-11-0	1-7-2	2					
3	2-4-2	2-4-4	0-10-6	2-4-1	2-4-3	2-4-2	2-4-2		0-9-7	1-1-2	2-11-3	2-11-3	0-11-3	1-0-3	1-1-0	1-0-0	1-7-7	3					
4	2-5-4	2-4-3	1-1-5	2-4-4	2-4-3	2-4-6	2-5-2		0-8-7	1-1-2	3-0-2	2-11-6	0-10-6	1-0-1	1-0-6	1-0-5	1-8-2	4					
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5	2-6-0	2-3-5	1-1-7	2-3-5	2-4-0	2-4-3	2-5-3		0-8-0	1-1-4	3-1-0	3-3-7	0-10-4	1-0-1	1-0-7	1-1-0	1-8-3	5					
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6	2-5-6	2-1-6	1-0-5	2-1-7	2-2-1	2-2-6	2-4-3		0-7-4	1-1-7	3-1-6	3-6-2	0-10-5	1-0-3	1-1-3	1-1-1	1-8-1	6					
6 1/2	2-5-1	2-0-2	0-11-4						0-7-3	1-2-2			0-10-6	1-0-5	1-1-6	1-1-1	1-7-6	6 1/2					
7	2-4-0	1-10-3	0-10-0	1-10-3	1-11-0	1-11-6	2-1-5		0-7-2	1-2-6	3-2-3	3-6-3	0-11-1	1-1-1	1-2-4	1-1-0	1-7-4	7					
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9	1-3-3	0-4-6	0-3-0	0-7-2	0-10-2	0-11-1	1-0-6		0-8-3	1-6-0	3-3-4	3-5-4	1-3-7	3-1-0		0-10-3	1-2-0	9					
10	0-0-2	0-0-2	0-0-2	0-0-2	0-0-2	0-0-2	0-0-2		1-8-3	3-4-0	3-4-0							10					
ALL DIMENSIONS GIVEN IN FEET, INCHES, AND EIGHTS TO OUTSIDE OF PLANKING.																							

ALL DIMENSIONS GIVEN IN FEET, INCHES, AND EIGHTS TO OUTSIDE OF PLANKING.

self, not just set in place to hold the motor.

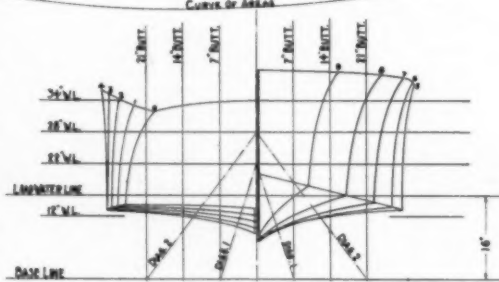
In a boat of this size the keel, chines, sheer clamps, battens and planking should be in one length, without splices. There should be no trouble in securing stock of sufficient length for this little craft from any lumber dealer.

The one important thing to be remembered in building a boat of this type is that when running at speed the entire weight is supported by the pressure of the water against the bottom, and that the



nothing of the pounding in a choppy sea. The floor timbers, especially at the motor, should be closely spaced and securely fastened.

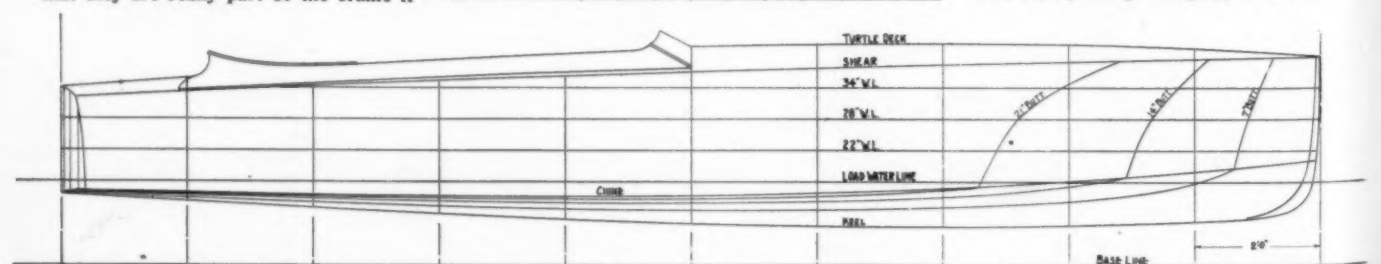
Even though the motor installed be of light weight the long engine bed stringers extending from forward of the flywheel to the transom will be necessary not only to carry the weight of the engine, but to stiffen the comparatively flat after sections of the underbody. They must be securely fastened to each floor timber so that they are really part of the frame it-



pressure is much greater than with a displacement type hull, and the underbody must be framed and fastened accordingly.

The raked coaming forward and the arm-rest effect aft are up-to-date and do help her appearance and comfort materially.

Taken all in all, this little craft presents a seaworthy and pleasing appearance.



# Tools and the Motor Boat

Good Tools, of Appropriate Size, a Great Help to the Motor Boatman

By T. W. Rockwell

**T**OOLS—implements of labor that man has found necessary for his existence since the earliest ages. Every man is at some time more or less interested in tools, whether a hammer and saw, or the complicated automatic machine tools used in the most highly specialized shops.

Men who use tools, whether motor boatmen, automobilists, mechanics, farmers or just the average man, appreciate quality in tools. No matter how skillful a person may be he cannot turn out good work with poor tools. As it is a hard job even for an expert to determine the quality of a tool from its appearance, the man who wants good tools must rely upon the reputation back of the manufacturer's name or the honesty of the retail merchant.

There are a number of manufacturers whose name or trademark on a tool is a guarantee of quality, and there are many reliable hardware stores that will stand back of any tool purchased from them. It must be remembered, however, that quality in material and fineness of finish cost money, and really good tools are never sold at prices that compete with the less serviceable article.

Ever since the times of the Phoenicians and the Vikings, a set of tools has been part of every vessel's equipment. There have been many occasions when a ship has been wrecked or damaged far from civilization and the crew have made repairs, or in a few cases even built a new vessel with the tools saved from the wreck.

In the days of the sailing ships no vessel left port without a ship's carpenter with his outfit of tools, and "chips" always found enough to do to keep him out of mischief. Aboard the steam-powered steel-built vessels "chips" is not so important a person, but every ship has facilities for mak-

There is little doubt that motor boating, both as a sport and an industry, has been held back to a great extent by the apparently great amount of work required for a little pleasure. During the last few years both the engine and boat builders have realized this, and a great improvement is noticeable in the equipment now available. There is still, and always will be, some work to be done in return for the pleasure and recreation derived from a motor boat.

The great majority of motor boat owners prefer to do the work themselves. Now, to reduce the time required for this work to a minimum, the first requirement is a kit of tools—good tools—adapted to the character of the work, the size of the boat, and to some extent dependent upon the purpose for which it is used.

It is not intended that the tools enumerated in the four sets described in this article are either the minimum or maximum number that should be carried, or that the sizes given are to be accepted as final. They may prove of value as a guide in selecting an outfit, but every motor boatman has his own personal preferences, and every motor installation its own peculiarities that should be considered. Every man will probably add several tools that will be particularly useful for his individual needs.

The tools and photographs were obtained by courtesy of Hammacher, Schlemmer & Co., New York.—Editor.

A set of tools for the small open boat or runabout. Nothing duplicated and every one useful

ing all minor repairs to the hull or power plant.

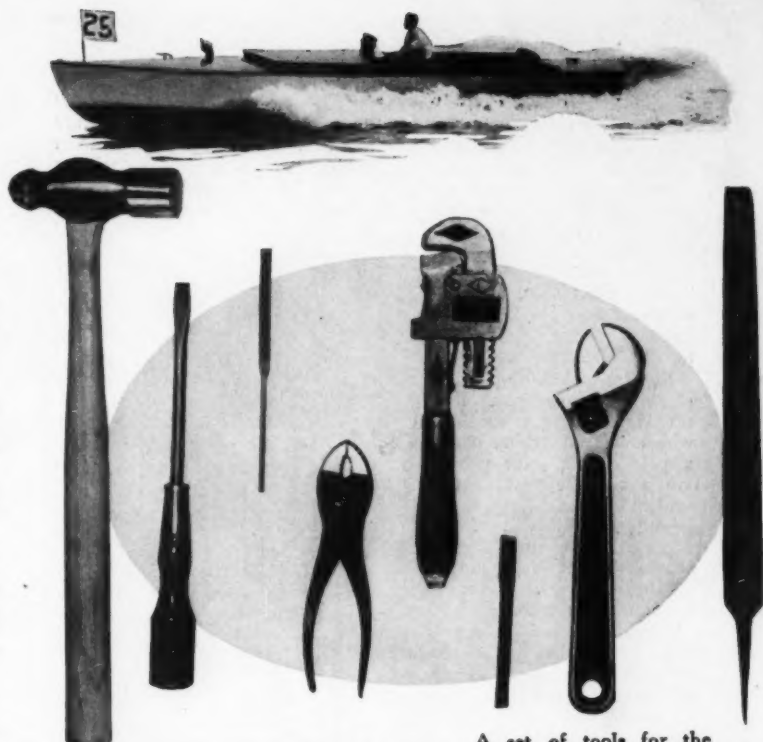
Of course, motor boats do not get as far from their home ports as ocean-going vessels, but when something goes wrong on a motor boat several miles from the nearest port, the owner is inconvenienced nearly as much as the crew of a vessel disabled at sea unless he can make the necessary repairs. The motor boat owner probably went out prepared for only a few hours sail,

while the ocean-going vessel is provisioned and equipped to be at sea for weeks or even months. As ocean-going vessels travel "ocean lanes" or well-established routes, the motor boat that is disabled anywhere but in much-frequented waters will not pick up a tow much quicker than the ship at sea.

Now, it is not to be understood that every motor boat should carry a complete outfit of tools to meet any emergency that may arise anywhere from a loose bolt or broken spark plug to a hole stove in the hull. The owner should be governed in selecting his kit of tools by the size of his craft and the distance he is liable to be from repair shop facilities. A small boat that is hardly ever more than a few miles from home does not need to carry as many tools as a boat of the same size that cruises over longer distances, and neither will have use for as many tools as the cruiser that makes trips of several hundred miles and is away from its home port for weeks or months at a time. In the latter case there will probably be use for the tools used in at least three trades—machinist, plumber, and carpenter.

The owner of a small boat or runabout that is used for only a few hours at a time, and seldom gets far from home will not find use for many tools while away from the mooring. He will have occasion to use a hammer about as much as any tool, so in selecting one it is well to consider all the uses to which it will be put. In the first place it should be fairly heavy, and of good balance. A machinist's hammer meets these requirements. When overhauling the motor and possibly at other times it will be necessary to cut new gaskets, and gaskets can be cut quicker, neater, and to a better fit, by means of a ball peen hammer than any other method, so a ball peen machinist's hammer is the one to purchase.

Loose nuts or bolts will cause trouble in any piece of machinery, and a gasoline motor in particular, so a wrench should always be carried. The old style monkey wrench



Every tool in this set will be found useful aboard the day cruiser or larger runabout. Similar tools of different sizes will save time—and your disposition—when the motor needs attention

will grip a nut about as tight as any, but the shape is rather awkward to use in the cramped quarters often encountered on a motor, and a wooden handle is liable to split. An all-steel wrench with the jaws at an angle of  $22\frac{1}{2}$  degrees with the handle will turn either a square or hex nut with the minimum sweep of the handle and the shape of the head allows it to be used close up to any obstruction. In fact, a wrench of this type can be used with just one-half the sweep of the handle necessary with a wrench where the jaws are parallel to, or at right angles to, the handle.

For tightening up the electrical connections, extracting cotter pins, bending wire and even pulling nails a pair of slip-joint pliers are about the most convenient tool. The slip-joint feature allows spreading the jaws to grasp large objects without having the handles spread so far apart that it is awkward to work with.

There are many patterns of screw-drivers, but by far the most convenient for general use is one with a fairly long blade, round at the handle and flattened only near the end. A round, fluted handle will afford the best grip when used at any angle. Two essentials are a good ferrule and a blade so fastened that there is no danger of its becoming loose in the handle. Some screw-drivers are made with the blade extending through the handle so they can be hammered; but why use a hammer on a screw-driver? Use a cold chisel.

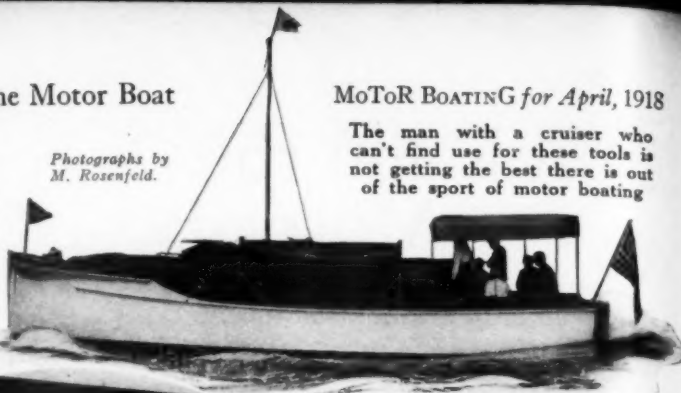
A file will often be handy in trimming off rough edges or burrs and for such work a single cut, flat file will prove the most satisfactory. For cleaning and smoothing up spark plug electrodes or truing up the contact points on the spark coil vibrator, there is nothing that will do the trick quite as good as a very thin, fine cut file made for that particular purpose.

Every marine motor has more or less piping connected with it, and the only tool that can be used successfully in handling pipe work is a pipe wrench. On the smaller boats it is not necessary to carry a pipe wrench large enough to grip the exhaust line. A wrench large enough to take care of the water and gasoline

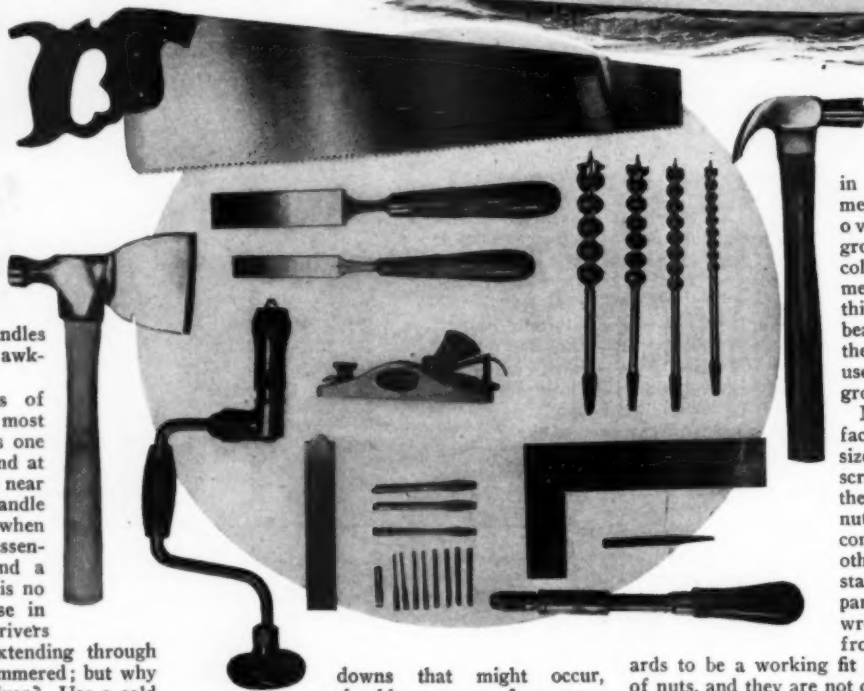
piping will answer the purpose.

Larger motor boats that are used for longer trips, yet are never very far from repair shop facilities for taking care of the more serious break-

Photographs by  
M. Rosenfeld.



The man with a cruiser who can't find use for these tools is not getting the best there is out of the sport of motor boating



water piping. In babbitted bearings where the motion is all in one direction the metal often "creeps" over into the oil grooves. A round-nose cold chisel is the best means of remedying this, and when the bearings become worn the same chisel can be used to deepen the oil grooves.

Most motor manufacturers use as few sizes of bolts and cap screws as possible, and the dimensions of the nuts are all made to conform to one or another of the accepted standards for such parts. Engineers' wrenches are made from the same stand-

ards to be a working fit on the various sizes of nuts, and they are not only more convenient to use than an adjustable wrench but there is also less chance of "chewing off" the corners of the nuts, making them hard to handle. The double-head type of wrench reduces the number of wrenches necessary to work with a given assortment of nut sizes.

Every motor boat owner wants to get the maximum power his engine will develop. As the power is directly related to the speed at which the motor operates, any increase in speed will mean an increase in power. It is possible to estimate roughly the speed of a motor, but to be certain a revolution counter should be used. This will eliminate all guess work and show exactly whether a change in adjustments is helping or hindering the motor.

Of all motor boatmen, those who own a cruiser will have the most use for tools. As these boats are often away from their home ports for weeks or even months at a time and travel many hundred miles during the course of a season's cruising, often far from any repair shops, they should—and generally do—carry a sufficiently large outfit of tools to make any ordinary repairs.

Cruisers making such trips should carry all the tools mentioned for the other boats and a few more that will be used from time to time, not only for making repairs when away on a trip, but for the spring overhauling.

A round file is one tool that will be used once in a while for such things as smoothing up or enlarging bolt holes and similar purposes. Keyways sometimes become damaged, and either must be trimmed up or new ones cut in their place. This can be done quite easily with a cape chisel.

The exhaust pipe connections will sometimes become loose or parts of it will need replacing at unexpected times, so it is wise to carry a large enough pipe wrench to do the work and if unions are used a monkey wrench of sufficient size to grip the union nuts.

As practically all cruisers have an electric lighting system, in addition to the ignition system, a pair of side cutting pliers will be needed when any changes to the wiring or renewals are made. An adjustable frame hack-saw with two lengths of blades will prove useful in many ways. Some of the blades should have

(Continued on page 92)



Every cruiser should carry a sufficient number and variety of tools to make all ordinary repairs and such little changes as may be found desirable from time to time

# PRIZE CONTEST



## IN QUESTIONS & ANSWERS

### Motor Boating at Night

Sailing at Night Gives Confidence in Ones Ability to Handle a Boat—An Efficient Electric Lighting System Almost a Necessity

THE PRIZE CONTEST—Answers to the first question in the February Issue

#### Motor Boat Navigation at Night a Real Joy

(The Prize-Winning Answer)

HE who has not steered his motor craft outward bound from harbor in the gathering dusk and all through the night has maintained way for the distant port into which he silently creeps just as the gray dawn makes visible the outlines of a still sleeping fleet, knows but half the pure joy which comes with the possession and use of a motor boat.

To be sure, not all nights find the water a smooth carpet bathed in silvery moonlight. A whole gale may come up out of the dark to test the power of the craft and the skill of the navigator. Then the wave crests tower seemingly to twice their daytime height. Or a thick wet fog bank may baffle all sight and distort the sound of the half dozen steamship whistles in the midst of which the dismayed navigator suddenly finds himself.

Such situations are welcomed by the true lover of motor boating, when he finds a chance to determine whether his knowledge is practical or theoretical. It is the spice of danger which is not really danger to the well-seasoned navigator who would be found when conditions were truly dangerous for navigation, snugly moored behind a breakwater where such a night afloat is not without its fascinations.

For the experienced motor boatman knows pretty well at sunset what sort of a night is in store for him knows when to run for shelter and when to hold his course. That is a part of his business.

To a large extent the strange fear which many motor boatmen feel regarding night sailing is groundless. In the latitudes most readers of MoToR Boating cruise in, summer nights are far more apt to be calmer and the winds lighter than the days, especially in the afternoons. The saying "Sun up, wind up," is more than half true in many sections. Fog, too, is commonest in the morning hours. These are the reasons why the experienced ones who migrate south each fall, make night runs of the outside stretches,—such as from Beaufort, N. C. to Southport, and Southport to Charleston, S. C., or across the Florida Straits from Key West to Havana.

Other factors make night work easy. The lights of lighthouses can be seen at night much further than the lighthouses themselves by day. There is less traffic in congested waterways. The stars make it easy to hold a course without a compass when necessary, and easier with a compass. But more than these things the veteran loves the night runs because of the rare charm which comes when night descends, the silence, the independence, and the

manner in which night draws shipmates closer to each other and to the big things of the universe.

Besides the necessary mental equipment of the owner, the properly equipped motor cruiser needs no special equipment for night work that she would not carry at all times. The Government requires that all lights, running and riding, should be carried at all times. There is little excuse for these not being electric nowadays in any boat over 25 feet, although it is well for safety's sake to have oil running lights for emergency use and for economy's sake an oil riding light when not in dangerous—or fashionable—harbors.

Binnacle lights, however, should be oil-burning, nothing but astral oil being used. The oil light is easier on the eye than an electric bulb even when frosted, and surer. Eye strain is

further lessened by shading all of the card except four points on each side of the course. If electric binnacle lights are used, wires must be crossed to prevent compass deviation. A shaded light should be used for lighting the chart table. Searchlights are of little use on the average cruiser, though occasionally handy in picking up unlighted buoys or making landings.

It is especially important that ample provision be made for lighting the engine-room. There should be a portable trouble lamp, and every cruiser should carry a dry battery hand torch. A pocket flashlight has been the means of saving life at sea by giving the boat's location to the rescuing vessel. Coston signals and rockets are better, however.

So much for lights. Every navigator should be provided with a good night glass. It is of tremendous value in on shore work. It should be borne in mind that the high-powered binocular is of little value as a night glass, its field of vision being too restricted. Other items of equipment which would aid in night work might be mentioned but they are relatively unimportant as compared with the skipper's knowledge of the local aids to navigation, the rules of the road especially as to lights, and ability to keep his head in an emergency.

B. B., Brooklyn, N. Y.

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#### A Good Electric Lighting System a Great Aid to Night Sailing

OUR feeling for the man who doesn't use his boat after dark is like that we had for a man who showed us a beautiful cruiser in a covered slip and told us it has never been out in the rain, we're sorry for him. Those of us who have to work for a living cannot get out of our boats all that's coming to us if we use them only week ends and holidays. Besides, the best time for relaxation and recreation is after the day's work is done. The night air is refreshing and there are fewer merchant craft about for us to dodge.

It is just as easy and in some places easier to follow the aids to navigation in the night as it is in the day time, and it is good fun to set a course from the positions of lighthouses and gas buoys. A person soon comes to recognize the shore lights as readily as he does the appearance of the coast itself, and stars are better guides than are clouds.

The first essential to the full enjoyment of night sailing is an electric light outfit. Even a pocket flash lamp is an almost indispensable convenience. Of course, one has to have the

#### Questions for the June Issue

1. Explain the best method of caring for a boat which is to be on shore all summer.

Suggested by S. W. F., St. George, Me.

2. Explain how to lay out and show development of a curved transom (stern) with some rake aft.

Suggested by A. O. G., Portland, Me.

3. Describe a practical method for removing a rusted or frozen key from its key-way.

Suggested by W. B. M., Newburgh, N. Y.

#### Rules for the Contest

Answers to the questions addressed to the Editor of MoToR Boating, 119 West 40th St., New York, must be (a) in our hands on or before April 20, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used. Questions for the next contest should reach us on or before the 20th of April. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions above, any article or articles sold by an advertiser advertising in the current issue of MoToR Boating of which the advertised price does not exceed \$25, or a credit of \$25 on an article which sells for more than that amount. (There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.)

For answers which we print that do not win a prize we pay space rates. For each of the questions selected for use in the next contest, any article or articles sold by an advertiser advertising in this issue of MoToR Boating, of which the advertised price does not exceed \$5, or a credit of \$5 on an article which sells for more than that amount. All details connected with the ordering of the prizes selected by the winners must be handled by us.

running light prescribed by law, but who wants to bother with kerosene for them when electric lights are so inexpensive and clean and don't blow out? By all means have as good an electric light installation as you can afford.

The compass should be well lighted; but when one looks up from a brightly lighted compass card he is blinded temporarily. The best compass for night work is that which has a lamp in the base shining up through the center of the card and deflected downwardly upon the card by a disc which covers all of the card except a small section at the lubber line. Such a compass can be read as easily at night as at any time and does not have any blinding effect. Lights or brightly lighted surfaces in front of the helmsman's eye should be avoided as they impair his vision.

Nothing is better for illuminating the chart than a small flash lamp. Such a lamp is decidedly useful in many ways, such as looking for things in dark corners or for examining the engine. And it's a lot safer to use than matches when you are looking for that little thing that dropped down into the bilge. The pocket flash lamp also meets the requirement that rowboats "shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision." Only don't forget to take it along when you go in your dinghy to the dock, —there may be an inspector waiting there for you.

A trouble light with good, long flexible wires is another decidedly useful accessory.

One more thing is very useful and that is a good spot light such as are made for automobiles. A 35 c.p. nitrogen lamp takes but little current, and if you haven't tried it you will be surprised at the distance it will throw its rays. It is a great help not only in picking up moorings and making landings, but in showing up the coast line, other boats, buoys, and all sorts of things like that.

Don't deprive yourself of half the pleasure of motor boating by staying ashore after dark, and don't forget the moonlight nights.

E. W. M., New York, N. Y.

## Sailing After Dark Gives One Confidence in His Ability to Handle His Boat

THERE is nothing more beautiful or fascinating than night running in a small boat. Some are deterred from it by the feeling that it is not safe, but compared with operating an auto all closed in as most of them are there is a large factor of safety in the boat. If a person understands their craft as they should there is absolutely nothing to be feared. By all means the most important things to be considered are the lights of any boat which is to be operated at night, and also the lights of the other craft one is apt to meet and their meaning.

Be sure you have your own lights so they burn bright and clear, and this practically means have them electric for safety and convenience, as well as economy, for electric lights to-day cost really less than oil, if your time is valuable, although good oil lights can be had, if a person is careful about picking them out. The next thing to learn is the other fellow's lights and the lights along the shore, especially the range lights, and wharf lights if you operate near a harbor. Then learn what the various running lights mean which the boats carry in your vicinity, as on some rivers you see three regular running lights approaching with three white lights one above the other in the rear, and you know it is a tow, with a long towline and perhaps a boom or two of logs stringing out behind. Then you see the regular running lights with two in series behind and you know it is a tow alongside, perhaps a barge of cattle. It is an interesting study to see the various lights and try to figure out what they mean, and it is surprising how easy it is to learn them all, and their meaning. Especially should you learn the shore lights and range lights, and you will be surprised to see how soon you can tell exactly where you are on the darkest night. You will find it very fascinating to run at night, and it will drive the cobwebs from your brains

sooner than any other one thing. It is great for the tired and overworked business man.

As I said electric running lights are cheap, especially as you have to have electric lights around your engine. This is absolutely necessary, for you cannot use an oil light around the machinery and tanks at night. You must have electric lights even if only a large trouble or flashlight and extra batteries. As long as you are going to have the electric lights why not have your running lights hooked up to the same circuit.

Operating a boat at night gives a man poise, calm judgment and control of himself and others in crises. It will give him confidence in himself, and once he tries it and sees how easy it really is he will be sorry that he has missed so much of the good things of this life, among them may be mentioned night running in a small boat. If you should feel a little shaky the first time you try it do not give up but stay with it, for even fellows who run nights all the time find the first time or so in a season they do it, that it has them guessing a little bit, but this soon wears off.

Be sure though that you have good lights, both running and around the engine, as this is the crucial point in having the best out of night running. Learn the other fellow's lights and what they mean. This can be found in any book on navigation or in the back numbers of MoToR Boating, to which the editor will refer you.

Also remember that anything we can learn of our boats and their operation in various conditions the more we will all be in a position to help our country if it should be put up to us to do so. Nothing is too small to have far-reaching effects in the present condition of affairs. Think what it would mean if every man who operates a small boat were capable of taking a fairly large sized boat or tow down his own river or harbor on the blackest night with perfect safety. We would have plenty of harbor pilots then and night running will do more to bring this about than any other one thing.

C. C. G., Portland, Ore.

# Laying Down the Deck Carlins

Several Methods of Finding the Radius to Which the Carlins Should Be Cut to Give the Proper Curve to the Deck

THE PRIZE CONTEST—Answers to the second question in the February issue

## Three Simple Methods

(The Prize-Winning Answer)

I AM submitting three methods of laying off carlins so they may be cut to the exact crown of the roof, all of which give about the same result:

Taking them as they come: Method I—Lay down the base line A-B, equal to the half-breadth of the cabin, divide into four equal parts, AE, EF, FG, and GB, and erect a perpendicular at E, F, and G.

Erect the perpendicular AC, equal to the camber or rise of the roof. Place the dividers on AC, and scribe the arc CD. Divide the line CD into four equal parts, CH, HI, IJ, and JD.

Divide the line AD into four equal parts: AK, KL, LM, and MD. Scribe the lines HK, IL, JM.

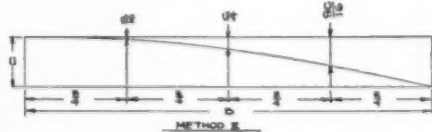
Locate the point N on the perpendicular at E equal to the line HK above the base. Locate the point O on the perpendicular at F equal to the line IL above the base. Locate the point P on the perpendicular at G equal to the line JM above the base. Take a batten  $\frac{1}{4} \times \frac{1}{4}$  inches and draw a line through the points C, N, O, P, and B. This should give a fair line as shown in the diagram.

Method II—This method just above explains itself in the diagram C equals the camber

or rise of the roof and B equals the half-breadth of the cabin.

Method III—This method also explains itself—C equals the camber and B equals the half-breadth. For a compass, use a stick with a nail in one end and a pencil at the other or at a notch in the side.

C. C. S., Newport News, Va.



C. C. S.—Simple methods the best

## A Simple Formula to Determine the Radius

A DECK or cabin roof should be true, even and symmetrical to be pleasing to the eye and to gain this desired end a certain and accurate method should be employed to lay out the beams or carlins.

The accompanying drawings and formula show a method which I know from experience to be simple and accurate.

Select a straight, clear batten a little longer than the deck and about 1-inch by 2 inches or less if the boat is a small one, place one end of this batten at the bow strip and the other pointing aft and midway between the clamps, this batten should be blocked up from the clamps with  $\frac{3}{8}$ -inch boards or the like, so as to form the profile of the deck, on the batten lay off points B at the center of each deck beam, then on the clamps lay off points A and C also on the center of deck beams.

Now choose a deck beam and draw a tight line or wire from A to C and measure up to the batten at B, lay these points out on the timber from which the deck beam is to be cut.

With the distances W and H determined compute the problem by the formula given and lay the radius off on another batten. Bore a hole for a lead pencil at point D and drive a nail through the batten and into the shop floor at E forming a pivot at this point to swing

the batten or radius bar on. Now place the timber so A will be exactly under D of the radius bar, and drive a nail through A and into the shop floor, forming a pivot point at A for the timber. Then swing the radius bar and the timber on their pivot points until D and C meet.

Draw the arc through point A, B, and C; if you have been careful with your measurements you will strike the points exactly.

Strike another arc from the same center to form the under side of the deck beam. Saw out the beam and move to the next, repeating the operation as before.

W. A. W., St. Paul, Minn.

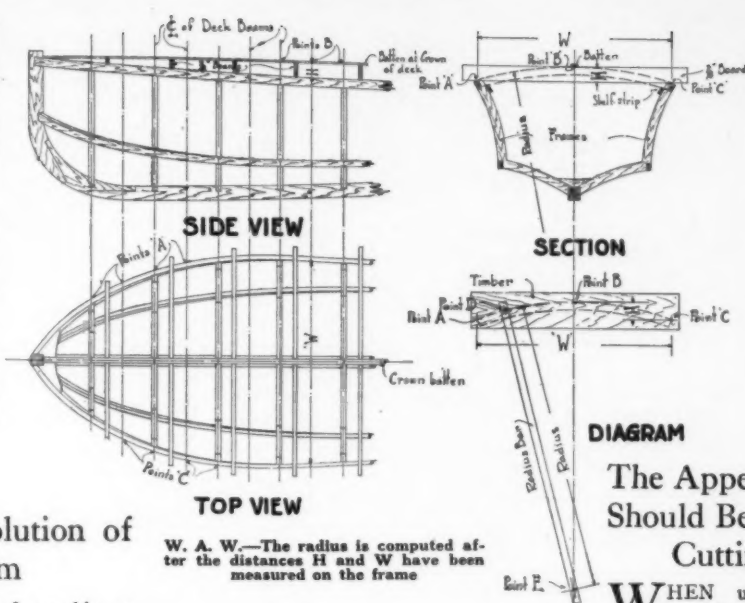
## A Mathematical Solution of This Problem

TO lay down the carlins of a cabin or deck, first fix upon the proper curves for deck and sheer lines. These will be determined by the requirements of headroom and appearance. The boat should be drawn out in elevation and plan as shown in Figs. 1 and 2, using a scale of  $\frac{3}{4}$  inches equals 1 foot or larger. Next the beams are spaced the proper distances apart on both elevation and plan, after which the center rise and span of each beam is scaled off the drawings.

With the rise and span of each beam known the radius of each may easily be calculated. As an example take the one shown in Figs. 1 and 2. This rise is 1 foot 1 inch or 1.08 feet and the half span is 4 feet 9 inches or 4.75 feet. The radius of curvature for this beam is now calculated according to the formula shown in Fig. 3 and is found to be 11 feet, nearly. In the same manner the radius for each beam is calculated.

After the radius of curvature of any beam is known it may be marked out on the timber from which it is to be sawed according to the method shown in Fig. 4. Using a pine strip about  $\frac{3}{4}$  inch by  $1\frac{1}{4}$  inches, bore near one end and along the center line two holes of a size to hold snugly a lead pencil. These holes are spaced a distance apart equal to the depth of the beam. The radius of the beam which is to be laid out is measured along the strip from the pencil which is to mark the top edge of the beam, and at this distance from the pencil a small hole is bored. Through this hole drive a nail into a block of wood which has been fastened to a smooth floor, this block being of the same thickness as the stock from which the beams are to be sawed. Lay down upon the floor the timber from which the beams are to be cut and by swinging the pine strip around the nail as a center, mark out the beam.

Fig. 3 also shows how the beams may be laid down by plotting the rise of the beam at a number of points. Lay off the span of the beam on a straight line as bf and compute the



W. A. W.—The radius is computed after the distances H and W have been measured on the frame

### FORMULA

$$\text{RADIUS} = \frac{4H^2 + W^2}{8H}$$

### EXAMPLE

If  $W = 75'$  And  $H = 6'$  What is the Radius

$$\frac{4 \times 6^2 + 75^2}{8 \times 6} = \frac{(4 \times 36) + (75 \times 75)}{48} = \frac{120 + 5625}{48} = \frac{5745}{48} = 119.6875'$$

$\frac{120}{48} = 2.5'$  Radius

## The Appearance of the Deck Should Be Considered Before Cutting the Carlins

WHEN undertaking an improvement which necessitates the removal and replacing of the cabin top. It is then that the amateur should carefully consider the various details necessary to make a pleasing and permanent job.

The usual method of procedure by the inexperienced amateur is to rip off the cabin top, gaze about in despair at the wreckage and being at a loss as to how to proceed with the job, begins to consult his neighbors in the yard for information. It is then his troubles begin.

In the accompanying sketches I have endeavored to show how these troubles may be avoided. As will be noted several types of cabin tops are shown each of which is practical and makes a good appearance.

When starting such a job I would advise the amateur to make a profile drawing of his boat, using a photograph as a guide, if the original plan is not available. Over this sketch in a new top as would best suit your needs, noting carefully how it adds to or detracts from the appearance of the boat. As noted on sketches, the edge of roof should be parallel to the waterline as near as possible, exceptions being made on the raised-deck type as shown.

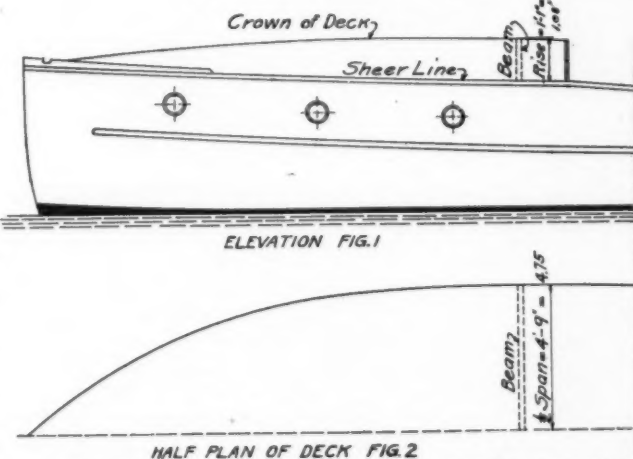
Having decided as to what would best serve your purpose, prepare the sides of cabin to suit, a fore and aft brace should be erected through the center as shown on construction plan. As noted thereon, the lower edge should be level with the sides as

ber of such offsets have been laid off to scale a thin batten is sprung to the curve thus outlined and the beam marked off. This method does not compare well, either in convenience or accuracy, with the first method outlined, but may be used to advantage where sufficient floor space is not available.

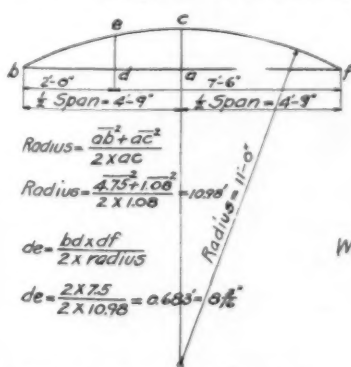
G. F. E., Burlington, Vt.

## MoTor BoatinG's Practical Handbooks

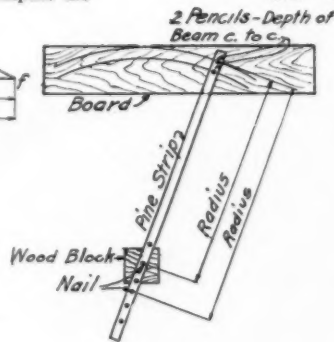
See special offer on page 34.



HALF PLAN OF DECK FIG. 2



CALCULATION OF RADIUS AND RISE AT ANY POINT FIG. 3



METHOD OF MARKING BEAMS FIG. 4

G. F. E.—Before finding the radius for the carlins the sheer line and the crown of the deck should be determined

an aid in determining the height at the various stations or spacings. The upper edge should conform to the pitch desired and be notched as shown to receive the beams when set in place. The method of fastening to sides is shown in details.

The method of laying out the various carlins or beams for sawing is a simple problem in plane geometry. As noted on Fig. V, erect a perpendicular F to line A D C, extending through D to B, which should be marked to represent the crown of roof at the various stations, connect A, B, and B, C, on which should be marked the width of cabin at the various stations with dotted lines as shown. With an improvised beam compass and a radius greater than half A, B, or B, C, and with A, B, and C, as centers describe arc's H.H.H.H. through the intersection of arc's drawlines E, E, to intersect perpendicular at



# The Use of a Chart Mini- mizes the Chance of Over- looking Details

**B**EFORE purchasing a second-hand motor, one should first ascertain the make and then carefully and systematically inspect the particular machine offered.

If the engine is not one of the standard make, or one which the prospective purchaser knows to have given satisfaction, he should delegate the inspection to someone, who has a knowledge of gas engine design. If he has not this requisite, himself, for the engine may be poorly designed and constructed, and, therefore, of little value no matter how well it may have been cared for and operated.

Even if the engine is of a make known to be reliable, it would be well to let someone who has had experience in repairing and overhauling pass upon it, as such a person should have a better sense of value than would a person who is entirely unexperienced. Failing this one will be obliged to make one's own inspection, and this should be complete.

First I suggest that a sort of a chart be prepared, something along the lines indicated and which I once used with satisfactory results. Of course, only the form is indicated, the details and completeness of such a chart must be settled by each individual accord to his own necessities. If one prepares such a chart the chance of overlooking details is greatly minimized.

Upon going over the engine it should first be looked over to see if any parts are missing and to ascertain what must be replaced, if anything.

The main shaft and any camshafts or timer shafts should be tried to see the amount of wear and all of these items carefully noted, and entered into the proper spaces on the chart. Try the flywheel to see if it is loose, if so it should be removed, as I have heard of cases where it was permitted to knock until the seating became sufficiently worn to make a nasty job here, and the end of the crankshaft examined to see if everything is all right.

These items ascertained the engine should be taken down, and the cylinders and pistons closely examined for scoring, pitting, or cracks. As cracks which may soon cause trouble are often quite invisible at the start, the cylinders should be hydrostatically tested if it be possible to do so, otherwise, a very careful scrutiny must suffice. If there is much carbon present, try it to see if it is comparatively loose and soft—such as would form in a season's use with the comparatively low grade of fuel now available. If very hard or showing evidence of having been neglected for a long time try to remove enough of it to determine the condition of the metal underneath.

The gudgeon pin and crankshaft should now be inspected to see if the crankpins or bearings and journals are in good condition. If these important parts are passable—always having in mind the price that is asked—one will be warranted in continuing the examination, therefore, now look to the rings and pistons. If there has been much escape of gas try to determine whether it is due to uneven wear in the cylinder, which may be expensive to remedy, or, as is more probable, to poorly fitting or worn rings.

The valves should now come in for a share of attention in order to note whether they or their seats have been badly pitted. If the owner has ground them in look for evidence of deep pitting and note whether the grinding has been properly done, evenly all around and resulting in a nice straight seating edge.

Next proceed to the bearings. Examine all to see if they had been much worn or if they will need re-bushing or rebabbiting as the case may be.

In order to obtain a fair idea of what must be done to put the motor in running order it would be well to pay some attention to the various nuts, bolts, and screws, in order to see if these have been stripped and require replacement. The various cams, tappets, and

springs should be seen to after which the cooling system and pump claim attention. Look particularly to the pump and check valves.

There now remains the ignition system and carbureter. The latter, not liable to get much wear, and the average amateur will be obliged to take something for granted as he will hardly be qualified to pass judgment upon it. In the matter of ignition equipment he should chiefly concern himself with the condition of the wiring and various contact points and connections. Is is easy to test this part of the equipment and to ascertain whether the coil or magneto are working properly and the quality of spark obtained.

Before reassembling the motor see if the gaskets and surface where they seat are in good condition.

I have said nothing about self-starters or a test run because the former should be examined by an expert, if there be any doubt as to their condition, while the latter may not be feasible. If a test run can be arranged for by all means have it as the behavior of the motor can be better noted.

In conclusion I would say, however, that a motor should never be purchased on the evidence of a test run alone and if a thorough examination is refused I should consider it sufficient cause for a refusal to consider the purchase.

Of course, only those who have some knowledge of motors will find even the most painstaking and systematic examination of avail, for unless you know what to look for, there is no use of looking for it and in such a case it would be well to call in some one who does know.

A. B., Scarsdale, N. Y.

# A Motor's History Not the Least Important Part

**"H**ANDSOME is as handsome does," declared an old adage, and the proverb applies to marine motors quite as well as to human beings. This leads us to the conclusion that performance is the true test of motor value, a fact which all motor boatmen will be quite willing to admit. It sometimes happens, however, that the motor in question is not installed in a boat, or if so installed, perhaps the boat is not in its natural element, and hence is not available for a test under its own power. Next best is a systematic inspection.

Assuming, then, that the motor which we contemplate purchasing is on dry land and that it is up to us to discover any shortcomings which might cause us to suddenly terminate negotiations, let us see what we should expect of a marine motor offered us for sale.

The principal castings should, of course, be sound. The base, sub-base, cylinders, and heads, together with the exhaust manifold should show neither cracks nor pinholes. Close examination will usually detect imperfections of this kind. Sometimes water not properly drained off when laying the engine up in the fall will have frozen in water jackets, or exhaust manifolds, and cracks thus caused may not be easily discovered.

Such defects are serious and may prove expensive to remedy. Satisfy yourself beyond a doubt that trouble from such causes is not to be feared.

The bearings should next receive careful

(Continued on page 92)

## Inspection Chart

### GENERAL:

Condition .....	Parts Missing.....
Bearing Test: Timer.....	Flywheel.....
Crankshaft.....	Camshaft.....

### CYLINDERS:

Bore No. 1.....	2.....	3.....	4.....
Head No. 1.....	2.....	3.....	4.....

PISTONS, BODY No. 1.....	Rings 1.....	Gudgeon Pins 1.....
2.....	2.....	2.....
3.....	3.....	3.....
4.....	4.....	4.....

### VALVES AND VALVE SEATS:

Valves No. 1.....	2.....	3.....	4.....
Seats No. 1.....	2.....	3.....	4.....

### MAIN BEARINGS:

Main Journals.....	
Conn. Rod Big End 1.....	Small End 1.....
2.....	2.....
3.....	3.....
4.....	4.....
Camshaft .....	
Timer .....	
Main .....	

### OTHER PARTS:

Cams .....	Tappets.....	Springs .....	Cir. Pump.....
Circulating System .....		Ignition System .....	
Carbureter .....		Magneto or Coil.....	
Behavior on Test.....		Wiring .....	
		Timer .....	
		Contact Points .....	

Notes .....

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A. B.—If the chart is filled out as the inspection proceeds you will have a complete, detailed description of the motor from which to judge its value

# Practical Navigation for the Motor Boatman



Time Signals by Wireless  
Longitude and Time  
Altitude Azimuths  
Summer Line

By W. Mark Angas

IN SEVEN PARTS—PART VI

Care of Chronometers  
Rating a Watch  
Time Sights  
Amplitude

THE computation of latitude from a meridian altitude of the sun is a fairly direct process as was explained in the previous article.

The reader will remember that no trigonometry was used in working latitude by meridian altitude of the sun or stars, the process consisting merely of the proper application of the corrected altitude of the observed body to its declination. The entire proceeding can be reviewed in a few words. The altitude of the sun's lower or upper limb, preferably the lower limb, is taken when the sun is on the meridian and this observed altitude is corrected for index error, semi-diameter, dip, refraction, and parallax. The corrected altitude is subtracted from  $90^\circ$  the result being the zenith distance which is called a north zenith distance if the sun bore south from the observer and vice versa. The sun's declination is obtained from the nautical almanac for the exact time at which the sight was taken, and is combined with the zenith distance by the following rule: "If the zenith distance and declination are of the same name add them and name the resulting latitude for both, if they are of different name subtract the lesser from the greater and name the resulting latitude for the greater." In this computation the question of time arises only in getting the declination of the sun, or in computing in advance what the chronometer or the navigator's watch will read when the sun is on the meridian.

The process of determining longitude by observation is not so direct as the above-mentioned method of determining latitude. The determination of longitude depends both upon the chronometer and the sextant, the principle of the so-called time sight or chronometer sight being as follows: At about eight o'clock in the morning or four in the afternoon the altitude of the sun is measured with a sextant, and the exact reading of the chronometer is noted at the exact instant when the sight is taken. The chronometer is an accurate clock whose error on Greenwich time is known to within a second or so. The application of the chronometer error to the chronometer reading, or "chronometer time" as it is called, gives the Greenwich mean time at which the sight was taken. The Greenwich apparent time at which the sight was taken is obtained from the G. M. T. by the application of the equation of time as found from the nautical almanac to it. As was pointed out last month longitude is the difference between the local time of a place and Greenwich time as well as the angular distance of the place east or west of Greenwich. The local apparent time of the ship can be calculated trigonometrically from the altitude of the sun, and the difference between this local apparent time (L. A. T.) and the Greenwich apparent time (G. A. T.) is the longitude of the ship in hours, minutes and seconds. The longitude thus expressed in

units of time can be converted to degrees, minutes, and seconds by the use of table VII, Bowditch, or by multiplying by 15, preferably the former.

Because the accuracy of the time sight depends so much upon the accuracy of the chronometer a few words will be said about the instrument before the details of computation are taken up.

The chronometer is a very finely built and accurately adjusted clock. It is mounted upon gimbals like a compass and is always kept in its stout wooden case, which, by the way, is only opened for the purposes of winding the instrument or using it for taking the time of a sight. For detailed instructions as to the care of chronometers the reader is referred to Bowditch. Chronometers often gain or lose time a good deal but this does not interfere with their efficiency as long as they consistently gain or lose at the same rate. If a chronometer is  $10^m 16^s$  fast of G. M. T. to-day and is known to gain a second a day it will be  $10^m 17^s$  fast to-morrow and  $10^m 23^s$  fast a week from to-day. The daily gain or loss of a chronometer is called its rate and the error of the instrument on G. M. T. must be computed each day by the application of the rate to the last correctly known error of the instrument. If a chronometer is fast of G. M. T. the correction is said to be a minus one, because it must be subtracted from the chronometer time in finding the G. M. T. Conversely, if the chronometer is slow the correction is a plus one. The reader should note carefully that a plus chronometer correction is added to the chronometer time to get the G. M. T. in working a chronometer sight, but if the problem is that of finding what the chronometer will read when the sun will be on the meridian for a latitude sight the plus correction must be subtracted from the previously computed G. M. T. of the meridian passage. Similarly, a minus chronometer correction is subtracted from the chronometer time (C. T.) when a time sight is being worked but is added when the chronometer time of the meridian passage is being predicted. The student should puzzle this out and convince himself of the correctness of the rule: Apply chronometer corrections with

signs as given in working time sights, and reverse the signs when predicting the chronometer time of the meridian passage of the sun for latitude sights.

Because of the absolute dependence a vessel must place on her chronometer in determining longitude it would be unsafe to trust to one instrument. Two instruments are no better than one, for a daily comparison of the two might give the information that one had got out of adjustment, but would not tell which instrument had gone wrong. Ships making long voyages must



This pelorus is the one shown on opposite page but is here shown arranged for solving the spherical triangle mechanically, giving the azimuth of the sun without any computation being necessary. The principle is that of the "Solar Attachment" used on transits, but the instrument is not capable of precise work



Taking an azimuth of the sun with the pelorus. For a description of the instrument see the November number of MoToR Boating

carry three or more chronometers and compare them daily. If one of the instruments goes wrong the culprit can be easily found and no further weight given to its readings for the remainder of the voyage.

The adjustment of chronometers is a delicate job and should under no circumstances be undertaken by any other than an expert in the work. Reputable dealers in nautical instruments usually employ a chronometer expert, and ships will place their instruments in his charge while in port. Before sailing the chronometers are brought aboard, the instrument adjuster having furnished with each instrument its exact error on G. M. T. and the rate at which it is gaining or losing. When this work is done by a competent man the chronometers will not be set, as such setting will throw them out of adjustment. The growing use of wireless on even small vessels is making the modern navigator less dependent upon the chronometer than was his predecessor of a few years ago. The time signals sent from large government stations afford an opportunity for vessels to check their chronometer errors daily at sea.

Motor boats, as a rule, do not carry chronometers unless going off shore, because the instruments are expensive and require careful daily winding if they are to give satisfactory service. For practice work a good watch will answer all the purposes of a chronometer, but the reader should not gather from this that offshore navigation can be undertaken with a watch for a chronometer. Even for practice work the watch must be a good one, and in good adjustment. It must be treated as much like a chronometer as possible and must be wound every day at a fixed time so that the same portion of the spring works each day. If the watch can be kept in a box in the house protected from temperature changes so much the better.

A watch which is to be used as a chronometer must be rated in much the same way that chronometers are rated, and this can be done by the student in either of the following ways: The most convenient method of rating a watch is to telephone to an instrument dealer who has an electrically-operated ticker or buzzer giving what are called time signals. These tickers or buzzers make some sort of a short sharp noise at each second of each minute up to about the fifty-fifth second when they remain silent until the sixtieth second, which is marked by the resuming of the signals. The student should get the instrument man to tell him which minute is coming next, and then hold the telephone transmitter near the buzzer. The sound signals can be distinctly heard over the 'phone, and the exact reading of the watch is to be noted when the first buzz comes after the little silence preceding the end of the minute.

Allowance must be made for the fact that our Eastern Standard Time is 5 hours slow of G. M. T., Central Time, 6 hours slow, and so on. The watch or chronometer being rated should be compared with the time signal at intervals of about a week and the daily rate worked out from the weekly gain or loss. If the rate is fairly constant the watch can be used for practice work as a chronometer, but if the rate varies the watch is unsuited for the purpose and the student will have to go to the trouble of comparing his watch with the time signal either directly before or after taking any chronometer sights.

In cases where there is no convenient dealer in nautical instruments who will let one hear a time signal over the 'phone it will be worth while to try and see if the telegraph station can render this service, for in some seaports this is customary. Some towns have a time signal at noon which can be used for watch rating if it is an accurately operated time ball; a whistle is never accurate enough for the purpose.

In the rare cases where all the above methods of rating a watch fail it can still be done by the aid of a star. The method of procedure is as follows: Choose a western window which has an outlook over the roof of a neighboring building so that a straight sky line is presented to view, and set a small tin sight, like the peep sight on a rifle, on the window ledge. If a star which is about to set behind the sky line of the near-by building be watched through the little peep sight it will be seen to slowly approach the dark mass of the building and will disappear with startling suddenness. The exact time of the disappearance is to be noted by the watch and a record of it kept.

This same star will disappear 3<sup>m</sup> 55.9<sup>s</sup> earlier each day and so by a little simple computing the rate of the watch can be obtained by taking the time of disappearance of the star at intervals of a few days. This method does not give the error of the watch, which must be obtained once from a time signal, but if the watch has a fairly constant rate its error can be kept track of for weeks by means of the star device.

On large vessels the three best chronometers are often kept in the captain's cabin, where they are safe from abrupt temperature changes and possible careless handling. On such vessels these fine instruments are never taken from the captain's cabin and indeed their cases are only opened once a day when the instruments are wound and from them the error of the "hack chronometer" is found. This latter instrument is inferior to the others and is generally kept in the chart room where it can be readily consulted by the navigating officers. On small vessels it is not customary to use a hack chronometer, one of the regular chronometers being used in taking time sights or the navigator's watch which has just been compared with the chronometer being used for the purpose. The custom of taking a fine chronometer on deck for the purpose of taking a time sight is to be unhesitatingly condemned for the unavoidable handling of the instrument and abrupt

temperature changes are sure to affect the rate. Unless an assistant in the chart room can take the time by the chronometer when the navigator gets a satisfactory contact of the sun's lower limb and the horizon it will be best to use a watch for the purpose.

When a watch is used in taking the time sights it will be necessary to get the difference between the watch and chronometer readings shortly before or after taking the sight so that the chronometer time of the sight may be computed from the watch time. The difference between the watch and chronometer readings is spoken of as the "C-W" correction and is managed in two different ways by navigators, the two methods giving identical results. Some navigators compare their watches with the chronometer, noting how many hours, minutes, and seconds the watch is fast or slow of the chronometer. The comparison can best be made by noting the reading of the watch when the chronometer reads a whole minute, simple subtraction giving the size of the C-W correction. If the watch is slow of the chronometer the correction must be added to the watch time of the sight in order to get the chronometer time at which it was taken and vice versa. Other navigators always subtract the watch reading from the chronometer reading in getting the C-W correction, even if it be necessary to add 12 hours to the chronometer reading to make the subtraction possible. The result of this procedure is a C-W correction that is always additive, but which will often yield a chronometer time that must be reduced by subtracting 12 hours from it; because as computed by the application of the C-W to the W. T. the C. T. will be more than 12 hours and therefore more than a chronometer can read.

To the beginner it may seem that there is a chance of making an error of 12 hours in the G. M. T. when working a time sight, and it may seem possible to get the Greenwich astronomical date wrong. The difficulty leading to these mistakes is, however, a difficulty of the class room and the examination room. When making a sea voyage one can hardly lose track of the Greenwich time and date and all trouble will be obviated if a rough mental estimate be made of the approximate time at Greenwich when the sight is taken.

Meridian altitudes of the sun must be taken when the sun bears due north or south of the observer, or, in other words, when the sun is on the meridian; time sights on the other hand can not be taken when the sun is on the meridian and are upon when taken the "prime vertical" or bearing from the observatory of determining be on the prime discussed in consequence of the azimuth the old sea custom sight at morning by ship parent time) and afternoon generally accurate sights. sight will not be taking a meridi-

When the sun will be vertical will be connection with the nautical tables, but to of taking a sight in the time (local apart at four in the ally insures fairly Taking a time found as easy as an altitude. The



An unusual kind of pelorus found on some foreign merchantmen.

sun will be found to rise or fall surprisingly rapidly and must be followed with the sextant's slow motion screw until a perfect contact of the lower limb and horizon is obtained. When the contact is perfect the observer should call out "time" to an assistant holding the watch or chronometer, who in turn will write down the exact time to the nearest second at which the contact was obtained and will enter with it in the note book the observed altitude of the sun as soon as the observer has read the sextant vernier. Because the method leads to greater precision than can be obtained from a single observation it is good practice to take three altitudes of the sun in rapid succession and work out the ship's position from the mean of the three altitudes and the mean of the three times rather than from a single observation. When three observations are taken an idea of the accuracy of the instrumental work can be obtained by noting whether the difference in latitude between the second and third sights and the time interval between the first and second sights. The sights should be taken at intervals of a minute or less. If the observer works with a fair degree of speed he can easily keep the assistant busy writing down times and observed altitudes and still keep his work accurate. Experienced observers can work without an assistant by having their watch in their pocket when taking an observation and counting seconds from the time when a perfect contact is obtained until the watch is taken from the pocket and read. The number of seconds counted subtracted from the watch reading is the time at which the sight was taken. This method yields precise results in the hands of an experienced man; in fact, the writer has met one good navigator who would take a sight from the bridge and walk to the chart room and consult the chronometer all the time keeping tally mentally of the seconds elapsing between taking the sight and reading the chronometer; but, of course, such ability to reckon seconds accurately is rare.

The computation of the time sight involves the use of a little practical spherical trigonometry, but should cause no trouble after some practice. The method is as follows: The watch time at which the sight was taken is written down and alongside it is written the observed altitude of the sun's lower limb, if three sights were taken the values are averaged in the usual manner. The C-W is applied to the W. T., the result being the chronometer time, C. T. The application of the chronometer correction, C. C., to the C. T. gives the G. M. T. which may, however, be in error 12 hours. A rough mental estimate of the time of day and date at Greenwich will enable a correction of 12 hours to be applied if necessary and the correct Greenwich astronomical date to be written down. The next step is to find the equation of time, Eq. T., and apply it to the G. M. T., thus getting the G. A. T. at which the sight was taken. While the nautical almanac is open it is well to find the declination of the sun at the instant the sight was taken, as the information is needed in solving the spherical triangle for the local apparent time at the ship. The declination is not used directly, but from it is obtained the polar distance of the sun, or distance from the sun to the elevated pole, or celestial pole which is above the horizon. The rule for finding the polar distance is to subtract the declination from 90° if the declination and latitude are both north or both south, that is, if they are of similar name, and to add the declination to 90° if the declination and latitude are of opposite name. The rule will not have to be remembered if one has a clear conception of what a polar distance really is. The other data needed for solving the spherical triangle for the L. A. T. are the corrected altitude of the sun's center, which is found from the observed altitude in the usual way, and the latitude of the ship by dead reckoning. The altitude, latitude, and polar distance are added, the result being divided by two and called the half sum. The following logarithms must be looked up from table 44, Bowditch. The secant of the latitude, the cosecant of the polar distance, the cosine of the half sum, and the sine of the remainder which is the difference between the half sum and the altitude. The sum of these logarithms is the logarithmic haversine of the local apparent time and the local apparent time can be found from it by finding the computed logarithmic haversine, or the nearest thing to it, in the table of logarithmic haversines, table 45. Table 45 gives both logarithmic haversines and natural haversines, the lighter figures in the table being the logarithmic haversines. When the computed value has been found in the table the local apparent time may be taken from the top of the page and the left hand column if the sight was a p. m. sight and from the bottom of the page and the right hand column if the sight was an a. m. one. Hours and minutes will be found from the column headings and footings at the tops and bottoms of the pages, and seconds in the left hand and right hand columns. The longitude of the vessel in hours, minutes and seconds is the difference between the G. A. T. and the L. A. T. If the vessel is in a western longitude the L. A. T. must be subtracted from the G. A. T., and if in an eastern longitude the reverse must be done. In both cases 24 hours may be added to the G. A. T. if necessary to make the subtraction possible. The longitude as found above can best be converted to degrees, minutes, and seconds by the use of table 7.

The method of taking out logarithms for angles given in degrees, minutes, and seconds is fully described in the Appendix of Bowditch, page 275. The explanation there given is complete and will not be repeated here, though the process of interpolation is illustrated in the problems accompanying this article. Particular attention must be paid to the explanation of the process of interpolation by inspection in the last two paragraphs of the page, and care must be used to avoid the mistake of applying this method in the first five pages of table 44 where it does not apply. The method of finding the local apparent time from the logarithmic haversine is not the method described in Bowditch's explanation of the time sight on page 142. The Bowditch

method is to take the sun of the logarithmic secant of the latitude, cosecant of the polar distance, cosine of the half sum and sine of the remainder and divide it by two, the result being the sine of one-half the local apparent time. The columns of hours a. m. and p. m. on the left hand sides of the pages in table 44 are so arranged that the local apparent time in the hour column is opposite to the sine of half the local apparent time in the body of the table. Thus it is merely necessary to find the nearest value in the sine column to the above-mentioned sine of one-half the local apparent time and take the local apparent time from the proper hour column, interpolating for seconds of time. The advantage of the method advocated in this article is that it obviates a division by two and an interpolation that is sometimes a cause of mistakes, it also obviates the necessity of adding 12 hours to the local apparent time as found from table 44 when the sight is a p. m. one.

No matter what method of computation is used the time sight for longitude is subject to inaccuracies brought about by error in the latitude by dead reckoning. Such errors in the latitude do not affect the longitude when the sight was made with the sun on the prime vertical, but because sights of the sun on the prime vertical can only be taken for approximately six months of each year in any given latitude some other method of obviating inaccuracy in longitude sights had to be devised than the obvious one of taking them when the sun bore due east or due west. The modern method of avoiding this difficulty is by the use of the Sumner Line or line of position.

The first method devised of getting a line of position was simple in theory but long and tedious in practice. A time sight was taken and worked out in the usual way, the position found being plotted on the chart. A new latitude was then assumed differing from the latitude by dead reckoning by about 10 or 20 minutes. The sight was worked again with this new value of the latitude and the second position plotted on the chart. A line drawn through the two positions is the Sumner Line, or line of position, and the vessel is somewhere on this line even if both the latitudes used in working the sight were wrong. A more modern and simple way of getting a line of position is to work out the sight with the latitude by dead reckoning and draw through the position thus found a line at right angles to the bearing of the sun, the line being the Sumner Line. This method of procedure involves the finding of the true bearing of the sun, but this should be done each morning and afternoon to check the deviation of the compass, so no extra work is involved as was the case when the sight was worked twice.

A method of computing azimuth from the same data used in working a time sight is illustrated on page 147 of Bowditch under the heading Altitude Azimuths. The method is to take the altitude, latitude, and polar distance and find the sum and half sum from them as before. In working azimuth the remainder, however, is the difference between the polar distance and the half sum, and the logarithms needed are the secant of the altitude, the secant of the latitude, the cosine of the half sum and the cosine of the remainder. One-half of the sum of these logarithms is the cosine of half the azimuth of the sun. The azimuth is obtained from this cosine by finding the angle corresponding to it and multiplying it by two. Azimuth is the angle between true north and the sun in the northern hemisphere, and between true south and the sun in the southern hemisphere, consequently a short mental calculation will enable azimuth to be converted to a bearing on the Navy type compass. A comparison of the true bearing of the sun and its observed bearing will give the error of the compass which is made up of both variation and deviation. The variation can be found from the chart and its application to the total error as found from the comparison of the true bearing of the sun and the computed bearing gives the deviation of the compass.

The trouble of computing the azimuth of the sun is saved if the Azimuth Tables, Hydrographic Office Publication Number 71, are used. These tables give the azimuth of the sun without any computation. The tables are divided into three parts, the first being for the special case arising when the ship is on the equator, the second for cases where the declination is of the same name as the latitude, and the third part where the latitude and declination are of opposite name. The tables are used by turning to the page headed with the ship's latitude to the nearest degree in the proper table of the three and looking in the column headed with either the declination of the sun as found from the nautical almanac, or the date in the small calendar at the tops of the pages. From this column the azimuth of the sun will be found opposite the local apparent time on the right or left hand side of the page. A problem illustrates the process more in detail.

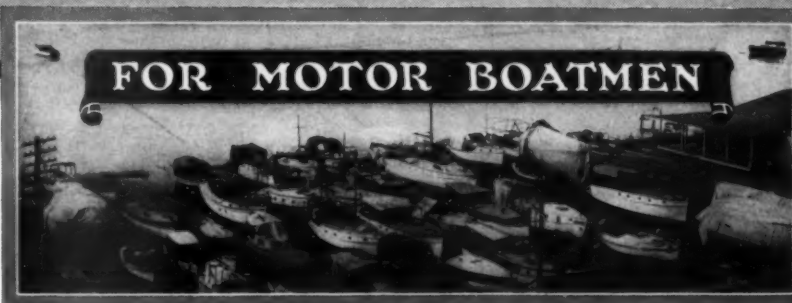
In cases where the compass error is wanted without the longitude being sought the simple method of the amplitude will be convenient. To take an amplitude, observe the bearing of the rising or setting sun when the lower limb's altitude seems about the sun's semi-diameter above the horizon. The true bearing needed for comparison with the observed bearing can now be readily obtained from table 39 of Bowditch. Table 39 is headed with various declinations at the tops of the pages and has columns of latitudes down the sides of the pages. The true amplitude is taken from the column headed with the nearest value to the actual declination of the sun as found from the nautical almanac and will lie opposite the latitude of the vessel to the nearest degree in the latitude column at the side of the page. The amplitude is the angle between the sun and true east or west. In any latitude the amplitude will be northern if the declination is northern and southern if the declination is southern. Thus, if the declination of the

(Continued on page 58)

# NEW THINGS

## FOR MOTOR BOATMEN

[Each month many new parts, attachments and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descriptions and publish only illustrations with short explanatory captions.

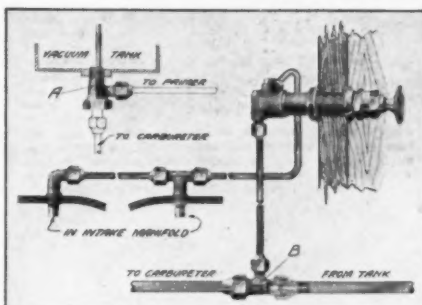


In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the manufacturers' names and addresses. Do not hesitate to ask us, as we have made special arrangements

to take care of this branch of our correspondence and are able to give you accurate information with the greatest promptness.]

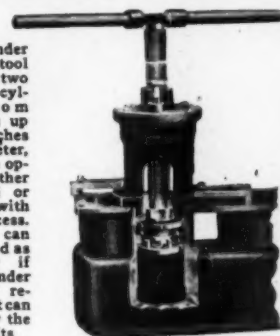


There is probably no place where more difficulty is experienced in lighting a cigar than aboard a boat on a breezy day. Here is an electric lighter that operates on a 6-volt lighting circuit. Such a lighter also reduces the fire hazard from matches carelessly thrown down while burning.

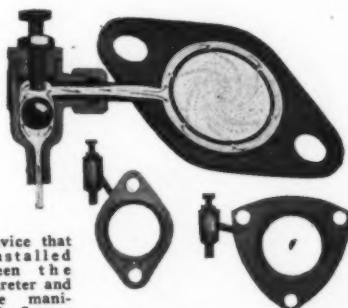
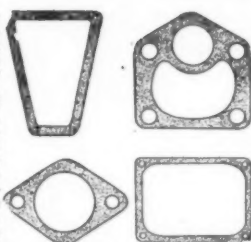


Electric starters will get large marine motors into action much more quickly if the engine is primed. Here is a priming system, with the pump on the bulkhead, that can be attached to the gasoline line at B, or a vacuum tank system as at A.

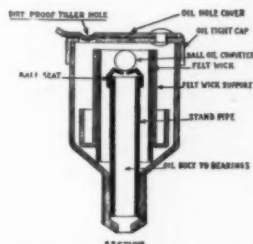
This cylinder reboring tool is made in two sizes for cylinders from 2 1/2 inches up to 15 inches in diameter, and can be operated either by hand or power with equal success. In use it can be attached as shown or if the cylinder heads are removable it can be held by the stud bolts.



A material for gaskets to make a tight joint between uneven or rough surfaces. It is made of ground cork, tightly consolidated and held together by a flexible cement, enabling it to be compressed, and conform to irregular surfaces. It is not affected by water, oil or gasoline, and is especially adapted for hand-hole plates, water connections and carburetor gaskets. It is made in three thicknesses.

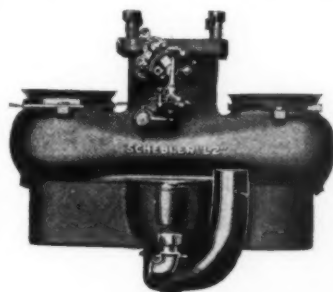


A device that is installed between the carburetor and intake manifold flanges and accomplishes three things. First, it is an auxiliary air inlet; second, it thoroughly vaporizes the mixture by setting up a rotary motion in the manifold and lastly it may be used as a carbon remover by attaching a piece of hose and allowing it to suck in water.

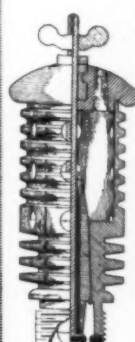


Do not feed oil to the bearings when they are not in motion. In this oil cup the oil is absorbed from the reservoir by the felt wick and fed to the bearing by the ball at the top of the spindle. In action, the ball hits the felt and carries a small amount of oil back to the duct leading to the bearing. The motion of the ball is caused by vibration or the motion of the boat.

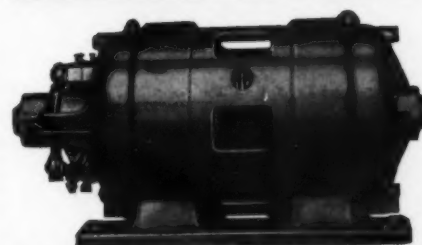
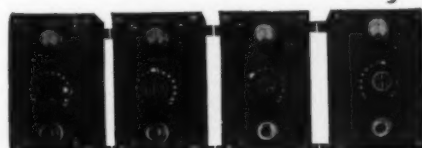
small amount of oil back to the duct leading to the bearing. The motion of the ball is caused by vibration or the motion of the boat.



A new model of a well-known carburetor that was designed for gasoline fire engines but which is proving very successful on large high-speed marine motors. The auxiliary air valves actuate gasoline dash pots, giving flexibility without choking the motor.



Those who have operated high-powered high-speed marine motors will be interested in this spark plug. The steel shell is in one piece. The tapered mica core is assembled on the electrode, and is securely held in place by inserting it while the shell is at a white heat; shrinkage does the rest. Large radiation surface is provided to keep the temperature of the plug well below the point at which pre-ignition takes place.



Yacht clubs and repair shops should be interested in this battery charging outfit. It will charge up to thirty-two batteries at one time, and at different voltages.



Another piston ring to help the compression. The particular advantage of this ring is that it is all one piece and it is almost impossible for the gas to leak past the long-lapped joints, even after the ring has become badly worn.

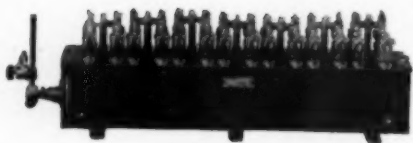


A new radiator for aeroplanes with large aperture through which the shaft extends to the propeller.

Do not fail to write to the editor if you desire information concerning any of the above new things

# New Things For Commercial Motor Boats

Some of the New Devices and Equipment Especially Adapted for  
Heavy-Duty Motors and Commercial Boats



Although this mechanical lubricator is not strictly a new device, it has a number of features that should appeal to the boat owner who is looking for the best equipment for his motor. All working parts are drop-mum. The feed is adjusted by the thumb nuts on top of each plunger. Most important of all, each unit can be removed and cleaned without disturbing the others. Made with right- or left-hand ratchet or rotary drive



much stronger than the older type. Finished in either nickel or blued steel

With the high price and uncertain delivery of brass goods these steel-body priming cups with bronze spindles should find a ready market. They are not only cheaper, but

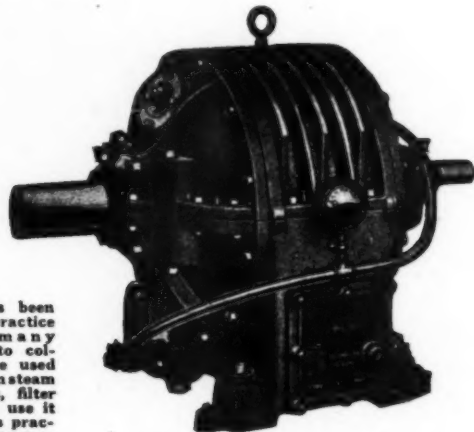


ever again. There is no reason why this practice cannot be followed with certain marine motors, with a very material reduction in the oil bill. These filters are made in six sizes for filtering from 3 to 50 gallons of oil per day

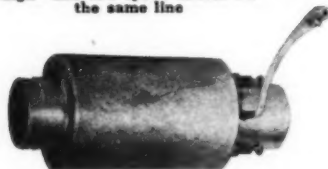
It has been the practice for many years to collect the used oil from steam engines, filter it, and use it



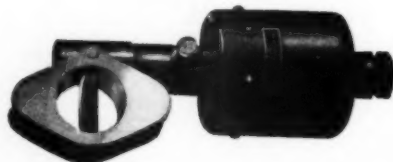
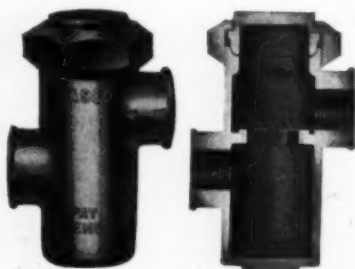
This winch can be operated from the main engine by either a gear or chain drive. The worm gear and drum bushings are of bronze, and the clutch is of the jaw type. Is built with either one or two nigger heads. No separate clutch on the main shaft is needed



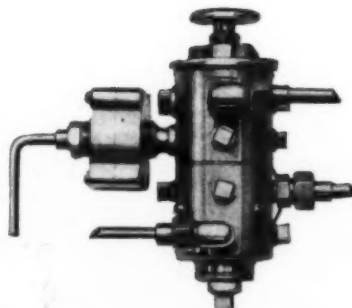
When high-speed marine motors are used in heavy boats a reduction gear is necessary. These reduction gears can be furnished in any capacity from 5 h.p. up. They are completely enclosed, and have the additional advantage of having the high- and low-speed shafts on the same line



This electric heater is particularly useful in supplying warm air to the carburetor when starting the motor and before the exhaust pipe is hot enough to make the usual heater effective



A butterfly throttle governor that may be installed between the carburetor and intake manifold of any motor. It operates from crank- or camshaft by means of a flexible shaft or bevel gear drive



A real gasoline strainer for the larger power plants made with standard iron pipe size connections. It is all brass and has ground joints. The cylindrical wire-mesh strainer is mounted on a brass collar that is easily removed by unscrewing it from its seat. Made in six sizes to fit from 1/2- to 1 1/4-inch pipe



A husky spark plug made especially for heavy-duty gasoline or oil engines. It has a mica core, all-brass shell and platinum-tipped electrodes



A new flexible tubing made of either brass or steel in twelve sizes ranging from 5/32 to 2 1/2 inches that can be used for gasoline, water, oil, or exhaust connections



Difficulties arising from carbon or oil on the spark plugs are chronic with some motors. This plug is so designed that carbon deposits are to a great extent eliminated, and the electrodes are shaped to prevent oil collecting on them and bridging the gap

The porcelain core of this spark plug is entirely enclosed by the steel shell, thus avoiding all danger of breakage. There is also a visible auxiliary spark gap between the top of the electrode in the porcelain and wire connection mounted on the fiber cap on top of the shell



Should a fire start in your boat, or a leak occur in the gasoline system, this valve will shut off the flow of gasoline from the tank. In case of a fire the valve is actuated by a system of small thermostatic tubing, while a device that is sensitive to gasoline vapor is installed in the bilge and operates in case of a leak. It is operated by compressed air

A closed-nose, non-fouling spark plug. When the gas within the nose of the shell is ignited, the blast through the opening clears the electrodes of any carbon or oil collected there



Do not fail to write to the editor if you desire information concerning any of the above new things

# YARD AND SHOP

## Lawrence Co. Wins Infringement Suit

The claims made against the Borman Corp. by the Lawrence Company for infringements on their method of repairing scored cylinders has been upheld by the United States Supreme Court of Illinois.

This decision gives the Lawrence Co., of Newark, N. J., sole right to use the Leonard Lorentowicz patent process of repairing scored cylinders without the use of heat or the necessity of regrounding the cylinder after the repair is made.

The method of repairing cylinders by this process is first to scrape out the scores, exposing a new, clean surface for the filling material to adhere to. The score is then filled with a silver-nickel alloy, fused electrically without the use of heat, and in such a manner that it adheres to the casting as if it was part of the iron itself. The weld is finished by scraping with special tools fitted accurately to the curve of the cylinder wall.

As neither the cylinder nor the weld is heated there is no chance of changing the shape or size of the cylinder bore, and as the cylinder is not reground new rings or pistons are not necessary.

The Lawrence process was patented by Leonard Lorentowicz and for a number of years has saved many thousands of engine cylinders, both automobile, marine, and stationary, from the scrap heap. When the Borman corporation started to repair cylinders in a similar manner legal action was taken, with the result that court has sustained the claims of the Lawrence company that they have sole right to use the Lawrence process under the Lorentowicz patent.

## The Baldridge Gear Co. Moves to Boston

The Baldridge Gear Co., formerly located in Detroit, Mich., has been sold and moved to Boston, Mass. The company has been reorganized and will continue the manufacture of the Baldridge reverse gear. Moving the business will in no way interfere with immediate deliveries or the prompt service to former customers as regards repairs or replacements.

The manufacture and sale of Baldridge reverse gears will be carried on actively in their new home, and the same services rendered to customers, as this has been a special feature with this company in the past.

## A Duplex Ignition System for Motor Boats

Certain advantages over current types of marine motor ignition justify entitle the Philbrin battery ignition system to the consideration of motor boat owners and manufacturers.

The Philbrin system consists of two separate and independent systems of motor ignition, each of which can be placed at the operator's disposal by means of a selective switch. These two systems are known as Philbrin single spark or main system and the Philbrin high frequency or secondary system, either of which will furnish ignition satisfactorily in case of the failure of the other. While both systems operate independently, the two systems combined form a unit actually smaller in size than the average single spark system.

The reason advanced for this combination or duplex system as it is called, is not only the extra assurance against ignition failure that is thus provided, but the certainty of having at one's disposal two systems that between them meet every condition of motor operation. For example, the single spark system is adequate under all ordinary operating conditions and is designed for this service.

The high frequency system, on the other hand, is designed for satisfactory motor ignition under such adverse conditions as poor fuel, faulty carburetion, a chilled motor, incorrect carburetor adjustment and foul spark plugs. This system has the unique feature of keeping the spark plugs clean without disintegrating the electrodes as often follows from the use of a high-tension magneto. The high frequency system gets its name from the fact that it delivers to each cylinder in its regular firing order a continuous follow-up of hot, intense sparks that will fire even the poorest mixture successfully.

The manufacturers claim the greatest economy of current and fuel for the Philbrin single spark system and at the same time a better performing, more flexible, powerful motor.

The design of the Philbrin breaker mechanism or contact maker as it is more familiarly known, is in itself the best assurance against lag, which as most motorists know interferes with proper ignition, either preventing the current from building up as it should, or failing through a mechanical fault of de-



sign or construction to supply the spark at the proper time. In other words, lag may apply be called the millstone around a motor's neck, always holding it back. It is interesting to note that the Philbrin contact maker has repeatedly demonstrated its ability to handle speeds in excess of any possible speed a motor can reach. There is never a speed attained which is so great as to prevent thorough saturation of the coil.

For this reason the conventional, automatic governor has been eliminated from the Philbrin system. As the makers express it, there are no inherent difficulties

by tremendous pressure, thereby preventing the entrance of moisture. The Philbrin coil is of the non-vibrating type and of special design encased in bakelite or condensite.

There are but three units to the Philbrin duplex ignition system—the distributor with which is combined the contact maker and condenser, the coil, and the selective switch that contains the magnetic interrupter and condenser for the high frequency system. As pointed out before, these two systems are entirely independent, the Philbrin switch providing for the use of either at will and also providing for the use of both storage battery and dry cells so that either source of current can be used.

While the single spark and high frequency systems are furnished separately, the manufacturers recommend the use of the duplex system because of its greater range of flexibility. This system is supplied in sizes for all motors, including four, six, eight, and twelve-cylinder engines of all types for every character of service. The manufacturers are the Philips-Brinton Co., whose factory and main offices are located at Kennett Square, Pa.

## Wisconsin Motor Mfg. Co. Capitalized at \$1,000,000

With the increase in capital stock to \$1,000,000, the Wisconsin Motor Mfg. Co., of Milwaukee, Wis., announces the completion of a large addition to the plant used mainly for the assembly of motors. This addition includes a sub-assembly and final assembly department in addition to a shipping department and stock room. Total floor space is 45,520 square feet. The assembly departments have a floor space of 28,003 square feet. The old assembly department has been converted into a machine shop. Also a brass foundry having 3,000 square feet of floor space has recently been erected by the company. These new buildings quadruple the capacity of the plant. They are modern in every way—well-lighted and well-ventilated and fitted out with the newest equipment.

A monorail system has been installed in the final assembly department. The motors are picked up from the assembly stands with electric hoists and conveyed direct to the testing department. This department, which is a recent addition, is electrically equipped throughout.

Each test stand has an individual electric motor generator unit. When a motor has been completed in the assembly room, it goes to the test room where it is run in with electric power until it is sufficiently free to run under its own power. After this it is hoisted by an electric crane of the monorail-type and taken to the final inspecting room. Here the motor is completely disassembled and all moving parts are thoroughly inspected and adjusted. Again the motor is placed on the test stand and is run several hours, after which it is ready to be shipped.

In addition to other improvements, a new sprinkler system has been installed throughout the plant. Also a new power plant with 300 k.w. generator has been completed. A large new office building is now being planned.

Wisconsin motors are all four cycle, built in four, six and twelve cylinders for tractors, trucks, passenger cars, motor boats and airplanes. Full description of any type may be had by writing to the manufacturers.

## New Sales Manager for Moto-Meter Co.

A. E. Barlow, well known in the automobile trade on account of his past activities as sales manager for both the Ever-Ready products and the well known Rayfield carburetor, has been appointed sales manager for Boyce Moto-Meters.

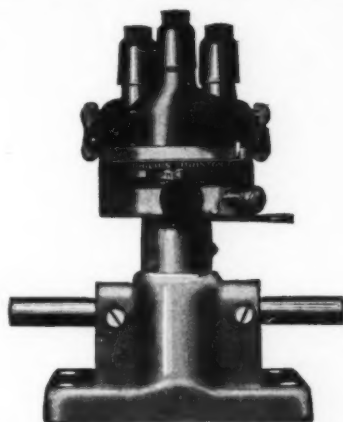
Mr. Barlow will have full charge of the distribution of this item through the dealer and jobbing channels, and will make his permanent headquarters at the main office and factory of the Moto-Meter Co. at Long Island City, N. Y.

It is the intention of the Moto-Meter Company to add a number of roadmen to its already rather extensive sales organization.

## A Military-Type Express Cruiser of Standardized Design

This boat is an evolution of the Great Lakes military type express cruiser of the past three seasons. The experience gained in designing, building, and operation of express cruisers during the last few years is represented in this new boat.

First of all, this 52-footer is seaworthy. The Great Lakes Boat Bldg. Corp. had a ample opportunity last summer to fully



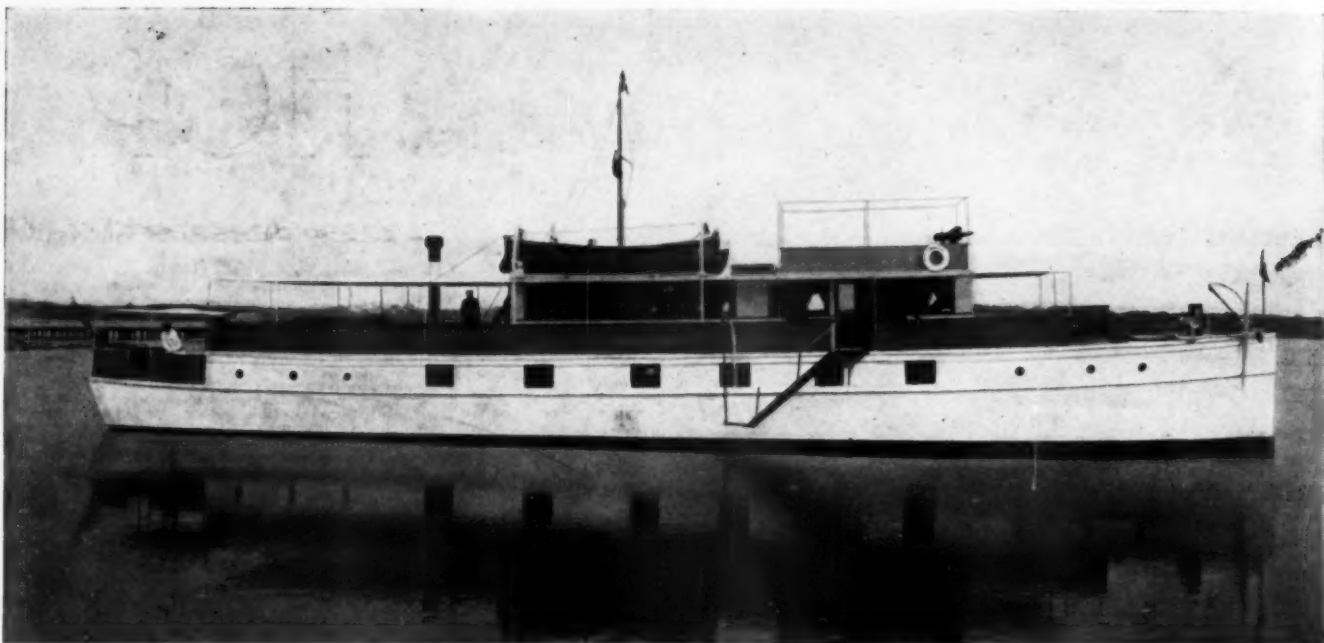
Distributor with magneto base mounting used in the Philbrin battery ignition system

in the Philbrin system that require the functions of an automatic governor to correct.

The Philbrin condenser and coil deserve special notice because of the provisions that have been made against any impairment of efficiency through moisture and heat. The condenser is of the armored type. It is puncture-proof. Its integral parts are held together



Assembling shop of Wisconsin Motor Mfg. Co., at Milwaukee, Wis., where Wisconsin Consistent motors are built. This department occupies over 28,000 square feet



**Hibiscus**—a cruising houseboat recently completed by McCoy Bros., of Daytona, Fla., and chartered for the winter by John Wanamaker. The power plant is a four-cylinder four-cycle 9¼ by 11-inch Anderson engine that gives the boat a cruising speed of 9 m.p.h.

demonstrate the behavior of their modified V-bottom boats. Walter Beauvais, the chief designer for the corporation, was out in some of the severest storms on Lake Michigan in both the 50-foot military type express cruiser and the 76-foot express cruiser Kumagin owned by Albert Pach. In fact, in the severest of the storms encountered at no time was any green water taken over the bow.

The corporation has been able to provide the same accommodations as have proved so splendidly successful and comfortable in the 50-foot military type express cruiser, and in addition to this, an engine compartment is provided in this new boat with full headroom and comfortable crew's quarters.

In the forepeak there is both a storage space and a bunk for one of the crew. Following this is the galley which is of the usual Great Lakes design, characteristically complete in detail. The forward

cruiser marks a big development in the standardized express cruiser line. This is the standard boat that the Great Lakes Boat Bldg. Corp. will build for the 1918 season. Three of these boats are already completed and another production schedule is now going through the big factory at Milwaukee. These boats are built to definite standardized specifications and are delivered to the owner completely equipped in every little detail and ready to run.

#### New Eastern Distributor for Kingston Carbureters and Ignition Devices

On March 1, 1918, the factories of Bynre, Kingston & Co. and the Kokomo Electric Co., of Kokomo, Ind., will transfer to Wm. E. Kemp, of 1733 Broadway, New York City, the distribution of Kingston products for the New England States.

The purpose of this change is to give better service with regard to repairs and deliveries to thousands of users of Kingston carbureters, magnetos, spark coils, spark plugs, switches, etc.

A large stock and repair station will soon be established in Boston which in conjunction with the present large stock and service station in New York City will make possible the best of service.

#### A New, Air-Cooled Spark Plug

In most respects this plug is different from what has become to be regarded as standard practice among spark plug manufacturers. It has a shell, it has a core and electrode points, it has a terminal nut. And strange as that may sound, that is about all it does have, for it has completely eliminated gaskets, washers, cement and even porcelain. Because you will be interested in knowing of this plug and the facts regarding its construction it may be described as follows: The shell or body consists of air cooling fins. The electrode is exposed and copper-jacketed where it extends through the upper chamber of the shell, which being heated sufficiently to cause expansion and the core then dropped into its place. The shrinkage when the shell cools grips the core so that it is both immovable

and absolutely proof against any compression leakage whatsoever.

On the whole this plug is an advancement in the art of spark plug making that has attracted the widest attention and unvarying favorable comment among the many noted motor engineers that visited the show. This plug is called the Dodwill air-cooled and is manufactured by the patentees, the Dodd, Williams Mfg. Co., of 7 E. 42nd St., New York, N. Y.

#### A Boatmeter Installation

One of the accompanying pictures shows the instrument board of the 28-foot V-bottom mahogany runabout shown at the booth of the Wisconsin Motor Mfg. Co., of Milwaukee, Wis., during the recent New York Motor Boat Show.

This boat was built by Hubert S. Johnson, of Bay Head, N. J., and has a speed of 30 m.p.h. It is equipped with a Wisconsin 125 h.p. high-speed motor and a Leece-Neville starting and lighting system.

This boat is especially interesting because of its complete instrument board. The instruments shown are the oil, and gasoline pressure gauges, the ignition control, ammeter, clock, revolution indicator and boat speedometer.

The speedometer shown just to the right of the steering wheel is the Masters boatmeter. The boatmeter is a very interesting little device in itself. It is said to be very accurate and even though it was first introduced only a year ago it is already used as standard equipment by a number of builders.

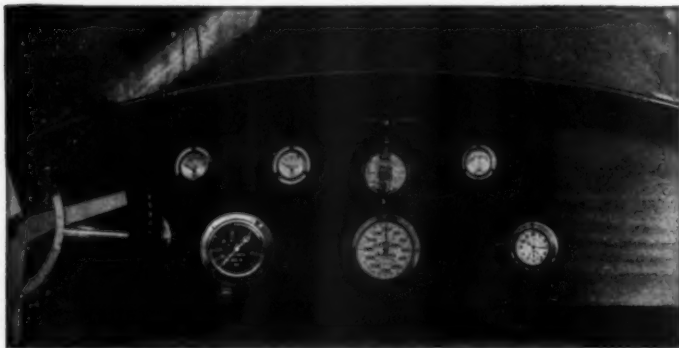
The simplicity of the boatmeter recommends it to every boat owner and we suggest that it would be well worth the time of any of our readers to secure a catalog of this instrument from the manufacturer, Irvin W. Masters, of Muncie, Ind.

#### Kid III, a Runabout of Unusual Design

Not all of the devotees of boating are obsessed with a desire for extreme speed. Recalling the days when a rowboat or canoe, and a basket of lunch, furnished the acme of enjoyment, many boatmen adhere to the slower craft, of a type they know from experience will retain stability in a seaway. So the Atlantic clipper model has remained in constant use while freak models have come and gone.

The clipper, Kid III, reproduced herewith, is the property of Nelson L. Barnes, of Chicago, having been built for him by the Atlantic company. It will be noticed that the equipment, from bow chock to stern railing, is most complete, including wicker furniture in a spacious cockpit.

The motor is installed practically amidships, and so covered as to eliminate even the slight noise of tappets moving push rods. From the driver's seat the engine, a Model E-2, 17.25 h.p. Sterling, is unheard, a degree of silence that has almost reached perfection in complete enclosure of all working parts of the motor. Starting is electric, so that no unnecessary delays will occur in getting away, and a moderate cruising speed of 15 m.p.h. is attained with perfect reliability.



Instrument board of Miss Consistency II, a Wisconsin-powered runabout, showing the installation of a Master's boatmeter

cabin is arranged with upper and lower berths, and is also equipped with a built-in Victrola on one side and a clothes locker on the opposite side, together with ample room for linen and silver. More than that, there has been provided in the forward cabin a completely-equipped lavatory which is a highly desirable feature.

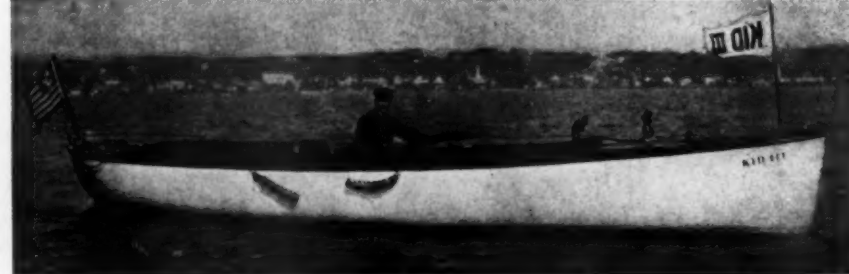
The bridge-deck immediately aft of the forward cabin is quite roomy and fully sheltered by awnings which are easily adjusted. The engine compartment and the after cabin is of the trunk design with walk on either side. The after cabin is arranged with extension berths which afford large size beds by night, yet are so arranged that they make very comfortable and attractive lounges by day.

It has been possible to build in an attractive dresser in this after compartment and there is also provided adjoining thereto a completely-equipped lavatory. The cockpit immediately following the after cabin is especially spacious and provides excellent accommodations which are so highly desirable for day cruising.

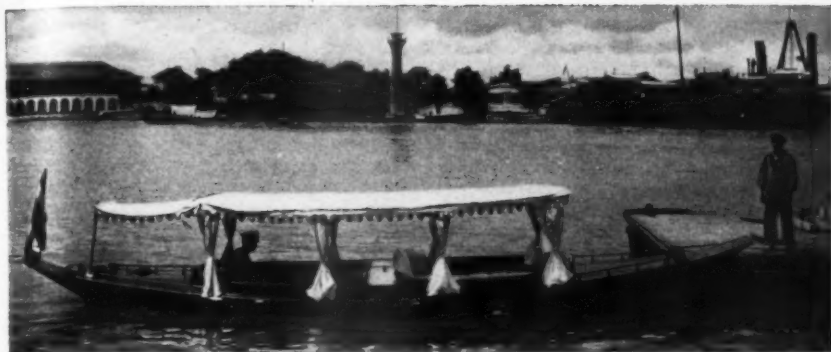
The one thing in this new 50-footer that is most important is the engine compartment. It has been possible to work out an engine-room with full headroom in a part of the space and half headroom in the balance. The engine is readily accessible and is at all times, of course, thoroughly protected and housed. The crew's quarters are also provided in this compartment for two, together with lavatory facilities. The power plant is an eight-cylinder Van Blerck motor.

The arrangement of the gas tanks is such that gravity feed is obtained from two tanks on each side of the boat in the engine compartment. Gasoline tanks are also carried aft, from which the fuel is pumped to the two tanks in the engine compartment. This absolutely eliminates all air pressure, which is, of course, very desirable in a boat of this type.

Altogether, this new 50-foot Great Lakes express



Kid III, a Sterling-powered runabout of unusual design



The native-built boat of the Minister of Marine of Siam. Powered with a 20 h.p. Kermath motor

The craft very comfortably holds seven or eight persons, being 31 feet long, 7 feet beam and 3 feet draft.

### Albany Boat Corp. Elects New Officers at Annual Meeting

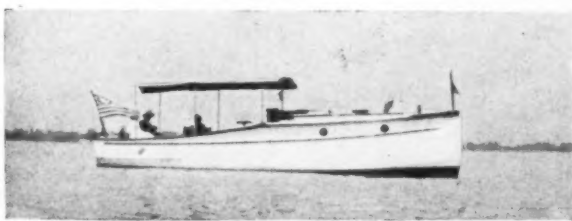
At the annual meeting of the Albany Boat Corp., of Watervliet, N. Y., designers and builders of the well-known standardized Albany runabouts, held on January 22, the following officers were elected: L. L. Tripp, president; G. C. Hugen, vice-president, and A. I. Phelps, secretary and treasurer.

### How to Make Your Boat Leak-proof

L. W. Ferdinand & Co., of 152 Kneeland St., Boston, Mass., are about to issue a new booklet—How to Make Your Boat Leak-proof—with Jeffery's No. 7 Black Soft Quality Marine Glue. The following paragraph taken from page 4 will give boat owners some idea of the contents:

"Brother, you can get rid of this pest—leaky water—that simply haunts the fishing boat. All it takes is a few hours' work so easy it should be as play to you; the putting into practice, on your own fishing boat, no matter in what age or condition the hull may be, of a few instructions that are simplicity themselves—the employment of material, cheap in price, plus a flatiron, sharp knife, hammer and a little heat. Then you will find that you have not only made your boat water-proof forever, but that you have stiffened the hull from fifteen to thirty-three and one-third per cent., completely banishing the idea that you will have to buy a new boat inside of a couple of more seasons. Some pretty big statements, I'll admit, but the proof of the pudding is here, if you but read on."

We believe that every owner of a boat will be interested in this booklet, and he should immediately ask for one. It will be sent free upon request. There is a use for glue from keel to topmast.



Cruiser built by the Richardson Boat Co. of North Tonawanda, N. Y., for Dr. W. W. Plummer, of Buffalo. The model D 24 h.p. Gray motor gives a speed of nearly 14 m.p.h.

### An Attractive 26-Foot Semi-Day Cruiser

The 26-foot semi-day cruiser shown in one of the accompanying illustrations was designed and built by the Richardson Boat Co., of North Tonawanda, N. Y. The boat is of medium construction, is strong and substantial throughout, of the V-bottom type, and you will note from the illustration is a clean cut little craft, and should appeal to the small boatman as it is not an expensive proposition.

This attractive 26-footer is owned by Dr. W. W. Plummer, of Buffalo, N. Y., and is powered with a Model D 20-24 h.p. Gray motor which gives her a speed of 14 miles per hour with the motor turning between 900 and 1,000 r.p.m. Dr. Plummer states that at this speed there is no vibration and it is hard to distinguish any noise on account of the smooth and quiet running qualities of his Gray motor.

### Knox Motors Associates

The Knox Motors Associates, of Springfield, Mass., take pleasure in announcing that E. J. Stone, formerly advertising manager of the company, has been raised to the position of assistant engineer, and E. C. Miner is now fulfilling his duties as advertising manager.

### Anderson Engine Handled by Pacific Marine Engine Co.

The Pacific Marine Engine Co., of Seattle, Wash., have taken on the Anderson engine and will carry a line of samples in their new salesroom at 78 Marion St. Mr. W. A. Nickerson is president and J. L. Patton, secretary and treasurer of this company, and both men are old in the game.

### Osborne-Marlowe Co. Exclusive Agents of Caille Inboard Motors

The Osborne-Marlowe Co., of 129 West Congress St., Savannah, Ga., have been appointed exclusive agents for the Caille inboard motors in Savannah and vicinity. This company has been in this line of

business for many years, is well-established and has a high commercial rating, so that Caille customers may feel that they are dealing with a responsible organization. The Balfour Hardware Co., of Savannah, Ga., continues to hold the agency for the outboard motors.

### F. E. Wellington, New Advertising Manager for Wyman-Gordon

The Wyman-Gordon Co., of Worcester, Mass., wishes to announce the appointment of F. E. Wellington as their new advertising manager. Mr. Wellington is well-known in the marine field.

### Addition to S.K.F. Plant

The S. K. F. Ball Bearing Co., of Hartford, Conn., on account of their increased business have found it necessary to build an addition to their present plant, thereby doubling the capacity of their factory. They hope to be able to supply the marine trade with bearings without the slightest delay in the very near future.

### Hess Takes Over Gordon Propeller Co.

C. N. Hess, of 1276 Melbourne Rd., East Cleveland, O., has recently purchased the land, buildings, machinery, patents, and patterns of the Gordon Propeller Company. A new organization will be formed to take up the manufacturing of Gordon reversible propellers.

### T. W. Simons & Co. Representatives for Anderson Engine in Far East

The Anderson Engine Co., of Chicago, Ill., have been constantly increasing their foreign business, and with their recent activities in this respect, will soon have direct agencies in all parts of the world. Thos. W. Simons & Company, the well-known exporters, with headquarters in San Francisco, have recently been appointed their representative to introduce the Anderson line in the Far East.

### Executive Committee of the N. A. of E. & B. Mfrs. Elects W. C. Morehead

At a meeting of the Executive Committee of the National Association of Engine and Boat Mfrs., held on March 2, W. C. Morehead, President of the Great Lakes Boat Bldg. Corp., of Milwaukee, Wis., was elected to occupy the place on the Executive Committee vacated by C. C. Gibson, of the class which expires at the annual meeting in 1920.

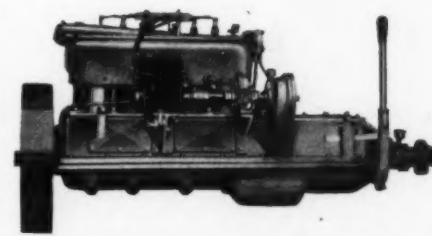
Mr. Morehead appreciates very much indeed this expression and action on the part of the various members of the Executive Committee, and will be quite happy to arrange to attend the regular meetings and shoulder such responsibility as is incident to a position of this kind.

### Hibiscus

One of the accompanying illustrations shows Hibiscus, a most attractive houseboat recently completed by McCoy Bros., of Daytona, Fla., and chartered this winter to John Wanamaker, the well-known merchant of Philadelphia, who states at the end of a 700-mile cruise that the boat and power plant were perfect in every respect.

It is equipped with a four-cylinder Anderson engine, having bore and stroke dimensions of 9 1/4 by 11 inches, which drives the boat at a rate of 10 miles per hour. At a cruising speed of 9 miles per hour the engine uses eight gallons of gasoline per hour, which is less than one gallon per mile for this type of boat.

Hibiscus is completely equipped throughout for long cruises. It has six single and one double stateroom, three bathrooms, dining room and saloon, in addition to captain's and crew's quarters, mess room, storeroom, galley, pantry, and ample locker and storage space.



Kermath Vanadium 20 h.p. unit power plant

## Personalities

### Harry J. Perkins



H. J. Perkins

Harry J. Perkins started in the motor boating industry in 1890, being one of the pioneers in the industry which has grown to such large proportions. His first position was that of draftsman with the Sintz Gas Engine Company which was moved from Springfield, Ohio, to Grand Rapids, Mich., this year. The engines were built from Mr. Perkins's

lines and he remained with the company for two or three years, leaving there to accept a position with the Grand Rapids Gas Engine & Yacht Company as draftsman, where he remained for two years.

Next he joined forces with the Wolverine Motor Works, at that time located in Grand Rapids, as draftsman. In 1904 he started the marine engine company known as the Michigan Motor Company and built both two- and four-cycle engines. This business continued under his management for two years, changing the name in 1906 to the Michigan Wheel Company, which is still in operation and doing one of the largest businesses in the marine accessory line to-day.

The motor, which was manufactured by the Michigan Motor Company, was sold to the Peninsular Motor Company, which was afterwards incorporated under the firm name of Sintz-Wallin Company. Mr. Perkins built his present large and attractive plant in 1907 for the exclusive manufacture of marine hardware where they still have an excellent business with a general line of marine hardware, gears, propellers, wheels, etc.

Mr. Perkins was one of the first original advertisers in the first issue of MoToR BOATING in the western territory.

### B. C. Saunders

During the last nine years B. C. Saunders, well-known to every one in the marine field, has been earnestly endeavoring to show motor boat owners the way to get the most out of their craft, both as to speed, safety and pleasure. Inasmuch as he owns two boats and has in the past owned several others, he might also be classed as a crank himself.

Unfortunately the war deal has made it absolutely necessary for Mr. Saunders to set aside the part of his business pertaining to motor boats and devote every ounce of energy to the manufacture of grinding machinery demanded by the Government and her Allies. The feature of this work, which grieves Mr. Saunders most, is the fact that he had to remain away from the motor boat show, a thing which he has always enjoyed immensely.

Mr. Saunders in his present capacity as sales manager of the Wilmarth & Morman Co., of Grand Rapids, Mich., is well thought of by everyone in the field.



B. C. Saunders

### Correction

On page 27 of the January issue of MoToR BOATING we failed to mention the fact that the U. S. patrol boat 1010 illustrated on that page is powered with two 50 h.p. four-cylinder Anderson engines.

### N. A. of E. & B. Mfrs. Elects New Officers

At a meeting of the Executive Committee of this Association, held Friday evening, March 1, the following officers were elected for the ensuing year: Henry R. Sutphen, president; John J. Amory, first vice-president; Percy C. Jones, second vice-president; Charles A. Ciqui, third vice-president; James Craig, treasurer.

# Liberty Loans of 1776

By Wm. M. Houghton

THIS is not the first war America has waged for democracy. It is not the first time the rich men of America have flung themselves heart and soul into a conflict prejudicial to their immediate business interests. On three major occasions, of which this is the third and greatest, the big capitalists of the country have backed democracy to the limit. Hence democracy's triumph—so far.

Yet capital itself is no friend of war, unless it be a little, comparatively inexpensive war with the prospect of a large imperialistic gain. No such definition will fit the American Revolution or the Civil War or the present war with Germany. Certainly, from the point of view of American capital, these great struggles to advance the cause of democracy in the world promised no dividends which could appeal to capitalists as such while involving an immediate destruction of wealth and values quite appalling to conservers of property. Those who would call any one of these wars a capitalistic war are using the epithet to clothe their hatred of patriotism.

For capitalists may be patriots before they are capitalists, and such has been conspicuously the case with American capitalists from the date of the first real test to the present day. The prototypes of our dollar-a-year men have sprung to the nation's rescue in every one of the great moments of her history—much as Mr. Bryan pictured his million patriots springing to arms, but with better effect. As it is to-day, so it was when John Hancock, Philip Livingston, and Robert Morris threw in the weight of their persons and fortunes with the cause of our forefathers, who were struggling to nourish in the wilderness the little flame of democracy which has since become such a mighty conflagration.

But history repeats itself in other particulars as well. There were abroad in the land then, as now, men who had to be "shown" that a rich man could be anything but a pocket-book patriot.

Almost everyone is familiar with the name and some of the details of the story of Robert Morris. No one thinks of him now as anything but a great patriot to whom we owe in a very large measure our national existence. Yet to a host of his contemporaries he was simply a predatory plutocrat and profiteer. He was vilified, persecuted and even threatened with death by a mob on one occasion when, it is said, he made one of the garrisons of James Wilson's house which was attacked by the angry citizens of Philadelphia.

If Robert Morris were alive to-day he would be a leader of finance in Wall Street, a member of the Liberty Loan Committee. For the little country of 4,000,000 inhabitants or less, which became a nation with his aid, he was all the loan committees rolled into one. He was the octopus, the money-bund, whatever you wish, turned patriot who carried his country on his own credit through emergencies and who devoted his indomitable energy, his ingenuity and resourcefulness, through most of the seven long heart-breaking years of that primitive

struggle to the cause of liberty. And all this while those who wished to gain political advantage or to satisfy personal spite crucified him on the platform and in print, so that his patriotism became a constant martyrdom. It takes a truly great man to "carry on" for democracy under such circumstances.

If anything, our national feeling toward our men of millions has undergone a slight softening since that day, despite the political capital made and to be made out of the process of confining them in straight jackets. It would seem that we are more prone to recognize to-day that all men are human, rich and poor alike, the humble with the great, and that all of us, when and if we get power or authority, will abuse it at times. Robert Morris was no exception to the rule. He made money hand over fist when he could (not much for these days, perhaps, but a great deal for his), and sometimes, perhaps, when he shouldn't. Due to some questionable high finance in the decade following the Revolution he landed in a debtor's prison and later he died a bankrupt, long since forgotten by the eager young nation at whose birth he had officiated so handsomely.

But in strict justice both to those ancestors of ours who abused him for his patriotism and then forgot him and to Robert Morris himself, it must be said that the financier would have been the last to consider himself neglected. If ever there was a man who could stand alone on his own two feet and cared for no other support, it was Robert Morris. He spent three years and some months in the debtor's prison in Philadelphia and in that time corresponded at length with those other great men, his comrades in glory, who remained his pals in his darkest hour; but never a snivelling word did he write of self pity or of grief at the ingratitude of democracies. He blamed himself only and expended his regret on the plight to which his speculations had brought his creditors.

But what wouldn't we, as a nation, give to-day to show him in the flesh some measure of that sense of gratitude which we have developed so long after his unhappy death! He wouldn't ask it or expect it, perhaps. His kind never does, even to-day. They run their course, whether of commerce or finance or patriotic service, or all three combined, unmindful of the tumult at their heels and rather better pleased, probably, if the truth were known when that tumult is not too laudatory. Such men are fighters. It is not for their sakes that we should publish our national appreciation of their devotion to country, but for our own.

It sounds rather typical to our ears to be told by certain of Morris's biographers that he had over-just preceding had nothing to that hence he hope of bet-such manner hostile con-handed down own cynicism

The fact is that Morris, although he had opposed the British Stamp Act of 1765, did not fancy war or independence and delayed until August 2, 1776, before consenting to sign the Declaration of Independence, incurring a large degree of unpopularity for his conservatism. He was the greatest merchant, banker and ship-owner of his day on this side of the water and of that sanguine temperament which has impelled many an imaginative American since then to carve empires out of the wilderness. The war interfered with his business and his dreams, and he refused, until the breach had become irreparable, to relinquish hope of a reconciliation with the mother country.

Yet in this frame of mind he practically abandoned his private business, put his shoulder to the wheel of state and in a few months assumed the entire executive function of government in the prosecution of the war. This was in Philadelphia in the discouraging winter of 1776-77, when Howe, the British general, was threatening the city from New Jersey and the Continental Congress had fled to Baltimore. Morris was a member of that Congress, elected the year before by the Pennsylvania Legislature. He was chairman of its secret committee, with power to contract for the importation of arms, equipment and gunpowder, and a member also of its committee on ways and means for establishing a navy. But he resisted the impulse to flee with it to Baltimore and, instead, stood his ground, deserted by the radicals who had only lately upbraided him for his reluctance to enter the conflict.

"Our people knew not the hardships and calamities of war," he wrote at this time, "when they so boldly dared Britain to arms."

This was the man who was accused then, and afterwards, of wanting the war and of helping to promote it to benefit his private fortunes! He was the greedy plutocrat of his day who was capitalizing the blood of his countrymen! Nevertheless, Congress found it wholly convenient to appoint him a committee of one to carry on the conflict, while, in safety at Baltimore, its self-appointed champions of the people shrewdly guessed that he was feathering his own nest in the process.

In those days Congress did not authorize Liberty Loans. War finance was not the fine art it has since become. Instead, it adopted the simple, and disastrous, expedient of issuing paper money with which to pay its bills. Robert Morris expressed his opposition from the first to this policy. He was well experienced in international trade and knew the value of a dollar. He was, indeed, the original "hard money" man among Americans, and subsequently the chief sufferer among Americans from "soft money."

The Continental currency rapidly declined in value and, even during this first winter of the Revolution, Morris found it necessary to bolster up the credit of Congress with a liberal use of his own. It was his function to put Philadelphia in a state of defense, to develop and preserve the beginnings of a navy

(To be continued)



Thirty millions of the first two Liberty Loans went toward the building of a fleet of several hundred of these 110-foot submarine chasers.

# Export and Import Trade Notes

Rulings and Decisions of the War Trade Board That Are of Interest to  
Manufacturers and Agents Engaged in Export and Import Trade

## Drawing on Funds to the Credit of an Enemy or Ally of Enemy

The War Trade Board promulgated on December 16, 1917 a ruling authorizing the payment of drafts accepted on or before December 14, 1917, drawn on funds to the credit of a person who is an "enemy" or "ally of enemy" or acting for or on behalf of an "enemy" or "ally of enemy," or on which such a person appears as drawer or endorser, when such drafts are presented for payment in the United States.

The Board has now determined to extend the above-mentioned date of acceptance from December 14, 1917 to December 17, 1917 and, for the convenience of those interested in the above-mentioned ruling of the Board is now reissued in full as amended by the extension of the date of acceptance. It is as follows:

## Provision for Drawing on Funds to the Credit of an Enemy or Ally of Enemy

The War Trade Board has authorized the payment of drafts accepted on or before December 17, 1917, drawn on funds to the credit of a person who is an "enemy" or "ally of enemy," or acting for or on behalf of an "enemy" or "ally of enemy," on which such a person appears as drawer or endorser, when such drafts are presented for payment in the United States; provided, however, that when such drafts are collected for or on behalf of any person who is an "enemy" or "ally of enemy" or person acting for or on behalf of an "enemy" or "ally of enemy," the proceeds of collection shall be at once reported by the person making such collection to, and be held subject to the disposition of, the Alien Property Custodian.

Attention is called to the fact that no drafts can now be accepted, or transferred or dealt in before acceptance, which are drawn on funds to the credit of any person who is an "enemy" or "ally of enemy" or acting for or on behalf of an "enemy" or "ally of enemy," or drawn by or to the order of such a person, or on which such person appears as endorser, unless a license is first obtained from the Bureau of Enemy Trade, Bond Bldg., Washington, D. C.

The War Trade Board has also authorized the payment of travellers' checks not exceeding \$100 in amount, on which there appears the endorsement of a person who is an "enemy" or "ally of enemy" or acting for or on behalf of an "enemy" or "ally of enemy," without obtaining a license therefor.

## Drafts and Checks on Credit of an Enemy or Ally of Enemy

As regulations are about to be issued aimed to prevent enemy endorsements from being placed upon negotiable instruments payable in the United States, and in order to avoid the enormous labor entailed in establishing the character of all endorsements on negotiable instruments, the War Trade Board has authorized, without procuring a license, the payment of sight or time drafts or checks, where the enemy character of such drafts or checks arises entirely out of the endorsement of such drafts or checks by one or more persons who are "enemies" or "allies of enemies" or are acting for or on behalf of such persons; provided, however, that when such drafts or checks are collected for or on behalf of any person who is an "enemy" or "ally of enemy" or is acting on behalf of such person, the proceeds of collection shall at once be reported by the person making such collection to, and be held subject to the disposition of, the Alien Property Custodian. The War Trade Board points out that the foregoing ruling, without benefiting any "enemy" or "ally of enemy" interests, will obviate the necessity of examining drafts and checks to discover "enemy" endorsements before paying or transferring the same.

The War Trade Board also announces that no licenses will be required to authorize the payment of an acceptance the drawer of which was not on the Enemy Trading List at the time of the acceptance of such draft, notwithstanding the name of the drawer is subsequently placed on said Enemy Trading List; provided, however, that when such drafts or checks are collected for or on behalf of any person who is an "enemy" or "ally of enemy" or is acting on behalf of such person, the proceeds of collection shall at once be reported by the person making such collection to, and be held subject to the disposition of, the Alien Property Custodian.

## Shipments by Parcel Post—A Caution.

The attention of the War Trade Board has been frequently called to shipments of goods on the conserved list which are being sent out of this country by parcel post. In many cases this is done, in the case of small shipments, by persons who are ignorant of the President's Proclamations concerning exports and who do not realize that in shipping goods by parcel post without first securing an export license they are violating the law and subjecting themselves to the penalty involved as noted in Section 2 of the Espionage Act (approved June 15, 1917) which reads as follows:

"Any person who shall export, ship, or take out, or deliver, or attempt to deliver for export, shipment, or taking out, any article in violation of this title, or of any regulation or order made hereunder, shall be fined not more than \$10,000, or if a natural person, imprisoned for not more than two years, or both; and any article so delivered or exported, shipped, or taken out, or so attempted to be delivered or exported shipped, or taken out, shall be seized and forfeited to the United States and any officer, director, or agent of a corporation who participates in any such violation shall be liable to like fine or imprisonment, or both."

## Shippers' Declaration and Consular Officials

The War Trade Board announces that Section 3 of the new "Procedure for Filing Shippers' Export Declarations and Export Licenses with Collectors of Customs" (effective February 1, 1918), which relates to the disposition of that copy of the Shippers' Declara-

tion, which in instances of shipment by vessel is delivered to the consular officer at port of discharge by the Master of said vessel, has been amplified as follows:

In the case of shipments by rail to foreign countries contiguous to the United States, the Customs Collector at the port of exportation will retain the copy of the Shippers' Declaration, as referred to above, and will deliver same to the consular officer nearest to his port. The consular officer, upon receiving said declaration, will forward it to the American Consular Officer nearest to the point of destination, as indicated on the declaration.

In case of shipments for export which have been made prior to and are in transit on February 1, the same may proceed under the old forms of Shippers' Declaration, provided said declaration is delivered in quadruplicate, as prescribed in T. D. 37337, under date of September 15, 1917, the fourth copy of said declaration to be rendered to the War Trade Board by the Customs collector after notations of short shipments, etc., have been noted.

Full instructions as to the new procedure of filing Shippers' Declarations and Export Licenses, also copies of the new forms, are contained in the "Journal of the War Trade Board No. 4," copies of which may be obtained from the Board in Washington.

## Export Declarations on Land Shipments to Canada or Mexico

The War Trade Board announces that all shipments made prior to February 15, 1918, and destined to Canada or Mexico via rail, vehicle or ferry, will not require the new form of Shippers' Export Declaration, which it was recently announced must be used in connection with export shipments made on or after February 1, but may proceed under the present form of Shippers' Export Declaration, provided said form is filed in quadruplicate. All shipments leaving the United States by vessels bound for foreign ports on and after February 1 must be accompanied by the new declaration form bearing the shippers' oath.

## Issuing Duplicate of License that Has Been Lost

The War Trade Board announces that hereafter no duplicate of an export license which has been lost will be issued, unless and until an affidavit is made by the applicant upon an approved form and filed with the War Trade Board, stating that the original license has been lost or destroyed and that no goods whatever have been shipped under said license, and agreeing that, in case the original license is found, the applicant will return the same to the War Trade Board immediately; and further agreeing not to ship or attempt to ship any merchandise under the original license under penalty of the law.

Forms of this affidavit may be obtained from the office of the War Trade Board in Washington or from any of its branch offices.

## Four Copies of Export Declaration Needed

The War Trade Board announces that, in order to avoid serious delay and congestion, it is of the utmost importance that exporters comply with the new regulations governing exports, public announcement of which was made on January 25, 1918. These regulations provide that, on and after February 1, 1918, all shipments for exportation from the United States to any foreign country, including Canada, Newfoundland and Mexico, require four copies of the Shippers' Export Declaration. Transportation companies will, hereafter, refuse to accept shipments for exportation, unless accompanied by the four copies of the Export Declaration.

## The "Five Per Cent More or Less" Clause

The War Trade Board desires to make clear to all exporters the meaning of the clause "five per cent, more or less" appearing on all export licenses under the space provided for the statement of the amount of merchandise to be shipped. This clause is intended to provide for slight excess in weight or measurement when the actual weight or measurement could not be actually determined at the time of applying for the license. This clause is not intended, and the Collectors of Customs have been instructed not to permit it to be availed of, to allow shippers to make a practice of deliberately shipping in excess of the amount stated in the license.

## Formation of Contraband Committee

The War Trade Board announces the formation of a committee known as The Contraband Committee of the War Trade Board, to assume its duties on February 12, 1918, and which committee will thereafter issue, withhold, and refuse export licenses in conformity with the policy of the War Trade Board.

The members of the committee are Charles Arthur Richards, chairman; P. Chauncey Anderson, W. Kingland Macy, George J. McCarty, and Richard A. Strong. Mr. Richards has up to the present time been director of the Bureau of Exports; Mr. Anderson, counsel to the Bureau of Imports; Mr. Macy, special assistant to Mr. Beavor White of the War Trade Board; Mr. McCarty has had broad banking and business experience; Mr. Strong is a well-known merchant of New York City, of the firm of Strong & Hewat.

Gordon Knox Bell has been appointed Secretary of the committee. The offices of the committee for the present will be at 1435 K Street, Washington, D. C.

The creation of this committee by the War Trade Board is for the purpose of facilitating and expediting the issuance or refusal of licenses and the ready solution of the many problems which arise daily in connection therewith.

## Statement as to Procedure by the Bureau of Exports

The War Trade Board has taken prompt action to prevent any congestion or delay in shipments of goods which have not hitherto required an export license, but which now will require one under the

new proclamation published February 15, and effective February 16, which includes all articles of commerce. The Treasury Department, acting on a request from the War Trade Board, has instructed collectors to accept Shippers' Export Declarations in lieu of individual license for all goods which have not hitherto required a license, when it can be shown to the satisfaction of the collectors that the goods are covered by either a bill of lading marked "for export" or a through export bill of lading, provided the bill of lading is dated February 19, 1918, or earlier, and further provided that the goods are actually exported by March 15.

In addition to shipments of the character described above, there are, of course, many shipments for export originating at or near the port of exit or drawn from warehouse stocks and delivered to vessel by a carrier other than a railroad. The Collectors of Customs will accept export declarations in lieu of individual license for such proposed shipments when it can be shown to their satisfaction that the goods will be exported on or before March 1. After March 1 all shipments of this character will require an export license before the export declaration will be accepted by the collectors. After March 15 all shipments of any character will need an export license presented with the export declaration.

In determining the date of export, as above, the following rule will guide the collectors: The date of the dock receipt or ocean bill of lading, or the date of the arrival of the goods alongside the steamer or dock, if shipped by lighter.

In the event of shippers forwarding goods on a through export bill of lading dated February 19, 1918, or earlier, and which shipment they can not be reasonably certain will leave the country by March 15, an application for export license should be filed immediately. After March 15 no export shipments will be permitted without an individual license.

Canada and Newfoundland.—Hitherto only certain goods have required an individual license when shipped to Canada and Newfoundland. This rule will continue to be in full force and effect, and only those commodities mentioned in the War Trade Board Journal No. 4, January 21, 1918, in front of which a star appears, will require an individual license when shipped to Canada and Newfoundland. In the case of shipments to Canada and Newfoundland of goods which are not starred in Journal No. 4, the shipper need only apply to any Collector of Customs who will accept his export declaration without an individual license.

The War Trade Board calls the attention of shippers to the fact that they can render material assistance to the board in connection with prospective shipments of goods which have not hitherto required a license and orders for which they now have on their books, by not attempting to immediately file applications for all goods regardless of the prospective date of shipment, but by giving preference in applying during the next two weeks, only for those shipments which they may reasonably expect will be ready for shipment in the immediate future.

## Resolutions as to Coupons Due Prior to and on January 1, 1918, Rescinded

In view of the President's Executive Order of January 26, 1918, which requires holders of coupons for foreign account to obtain certain certificates from the Federal Reserve Board and otherwise conform to its regulations, the War Trade Board has revoked its former rulings which authorized the collection of coupons due on or before January 1, 1918, for foreign individuals, firms and corporations without obtaining licenses from the War Trade Board, or authority from the Federal Reserve Board. The action of the Board is set forth in full in the following preamble and resolutions adopted by it:

WHEREAS by an Executive Order of the President, dated January 26, 1918, covering foreign exchange and other related transactions, the holders of coupons for foreign account must obtain from the Federal Reserve Board certain certificates and file certain declarations from foreign correspondents:

"RESOLVED that the following resolutions of the War Trade Board, relating to the collection of coupons due January 1, 1918, and prior thereto, for foreign individuals, firms, corporations, or others, be and they hereby are repealed, namely:

(1) "RESOLVED that bankers and others having coupons to collect, due January 1, 1918, for foreign individuals, firms, corporations, or others, are not required until further notice, to obtain licenses from the War Trade Board or authority from the Federal Reserve Board in order to make such collection: PROVIDED, that any funds so received which the collecting agency has reason to believe are the property of an enemy or ally of enemy, or will be used for the benefit, directly or indirectly, of any enemy or ally of enemy, must be held in separate account under notice to the Alien Property Custodian." (Adopted December 31, 1917)

(2) "RESOLVED that banks and others having coupons to collect, which are due prior to January 1, 1918, for foreign individuals, firms, corporations or others, are not required to obtain licenses from the War Trade Board, or authority from the Federal Reserve Board in order to make such collection: PROVIDED HOWEVER that any funds so received, which the collecting agency has reason to believe are the property of an "enemy" or "ally of enemy," or will be used for the benefit, directly or indirectly, of an "enemy" "ally of enemy," must be held in separate account under notice to the Alien Property Custodian."

## General Blanket License to Canada

A general blanket license has been issued today permitting, without individual import licenses, the importation of all commodities from Canada with the exception of those mentioned in the President's Proclamation of November 28, 1917, this to be in force until revoked by the Bureau of Imports.

With respect to shipments from all other countries, importers are urged to make haste in sending to the Bureau of Imports, Washington, D. C., their applications for import licenses.

# Commercial Boat News

Trade Notes and Announcements of Interest to the Commercial Boat Owner



U. S. Government dispatch boat Azalea, used in southern California waters by the Immigration Department. Powered with two eight-cylinder Model FH Sterling Motors

## Motor Dispatch Boat

This craft is a U. S. Government dispatch boat used in Southern California by the Immigration Department. While the super structure suggests a tug, in reality the Azalea is very fast, being capable of 21 m.p.h. The motors are two of the Model FH, eight-cylinder, counterbalanced crankshaft Sterlings, of 80-115 h.p. each, the latter rating being at 800 r.p.m.

Both the Azalea and the Ellington, a sistership, have been in service continuously since early 1917, when they were launched from the yards of Fellows & Stewart, Wilmington, Cal. The boats are 61 feet long, 10 feet beam and 3 feet draft. They are heavily built, as will be noted, being so constructed that they are capable of running outside as required.

The twin Sterlings are equipped with electric starters and generators, facilitating the handling so that the boats are unusually easy to operate.

## Launching the Palawan

The new three-masted motor schooner Palawan was launched January 26, "all standing" at the shipyards of Frank Stone in Oakland. This is the first vessel to be launched in this manner for many years about San Francisco Bay. The launching was made a gala occasion and was attended by a delegation from the Oakland Chamber of Commerce. The vessel was christened by Mrs. Henry Atkins, the wife of one of the owners.

The Palawan is 180 feet in length and has a gross tonnage of about 1,000 tons. She is built with a double deck and is expected to be an extremely seaworthy vessel. Besides her three masts, schooner rigged, she is fitted with two Union gasoline motors, each of 110 h.p.

There are twin propellers for the vessel, and as there was not room enough aft to put in clutches, behind the reverse gear, a coupling was put on each shaft and each provided with a brake. Thus under sail, the shafts may be uncoupled, and the propellers allowed to turn without hindering the speed of the vessel. When requiring to re-couple, the brakes are set and the propellers held still until the shafts may be coupled up again.

Another innovation is the arrangement of the lighting plan. When the main engines are running, both dynamo and pumps can be detached from the auxiliary engine, and worked from an idle shaft, the connection being made by a belt from the main port engine.

## An Inexpensive Fishing Boat

The illustration shows a heavily constructed fishing boat 36 feet long by 8½-foot beam built and owned by J. H. Lange, of Sebewing, Mich. The power plant is a Model D four-cylinder four-cycle Gray Motor. Although the boat is used in all kinds of weather and was in service until the lake froze over, Mr. Lange states that he has had no trouble whatever with his motor.

The boat complete without the power plant was built at an expense of only \$150. The construction is heavy and substantial throughout, but the little Gray drives it along at a speed of 8 m.p.h.

## Toppan Life Boats

The Toppan Boat Mfg. Co., of Boston, Mass., well known in the past for their ability to meet all demands for power boats, have added to their general line a line of life boats built according to the United States Government specifications, and built to meet the great demand for this type of boat which is being created by the United States Navy. These will be built in two sizes, 24 by 7 feet and 30 feet by 8 feet. They will be furnished complete with sail and tanks and built according to the U. S. Steamboat Inspection regulations and the model will be practically the U. S. whaleboat which is used in the Navy. The Toppan Boat Mfg. Company are fast at work on a large stock of these boats and will be able to make sales from stock to steamships and other boats requiring life boats.

The Toppan life boats are planked with high grade cypress, heavily galvanized fastened, with oak steam bent timbers and oak stem, stern and keel. They are very wide and strongly constructed, and will stand the heaviest of seas with perfect safety. They are stiff, and will not be cranky in roughest of water. The Toppan Company have furnished many boats of other types to the Government and are noted for their wonderful seaworthy boats, and surely the life boats which they are putting out will be no exception to their past products. They are furnishing many of their 17- and 19-foot rowing bank dories are tenders for patrol boats in the different parts of the country, and make a specialty of good strong rough water dories, capable of doing the roughest of work with great satisfaction. They are also furnishing to the Brooklyn Navy Yard their 22-foot power dories, equipped

with 9-12 h.p., four-cylinder, four-cycle motors, which will give a speed of around 10 m.p.h. for tender work on the Coast Patrol boats, also have furnished their 20-foot lapped-straked Swampscott power dories, equipped with 6 h.p., two-cylinder motors for the same work. These latter boats are especially well adapted for this work as they carry ten persons, are fairly light in weight and easy to haul up on their davits.

## Chinese Junks Being Replaced by More Modern Craft

Travelers in China comment on the disappearance of the Chinese "Junk" from the coastwise and river trade of certain parts of the country. They point out that the large Chinese sailing craft of uncouth shape, huge square sails and high sterns, with their hulls brilliantly painted to frighten away sea devils, may have to give place to more up-to-date means of water freight and passenger carriage. It is stated that the first of these boats appeared in the third century before the Christian era and, at one time, that vessels of this kind formed the Chinese Navy.

It appears that in nearly all the larger ports outside of Shanghai—in the latter port the number arriving and clearing in 1916 were said to be greater than in 1915, although the tonnage was smaller—for the hundreds of these craft formerly seen, there are now only

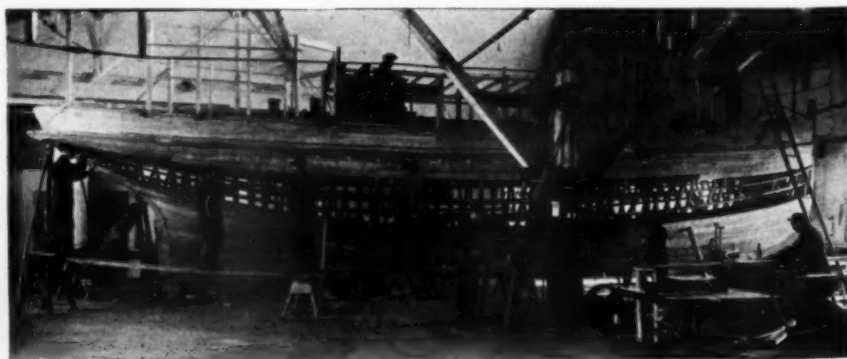


A heavily built fishing boat powered with a four-cylinder, four-cycle, Model D, Gray motor

dozens of them and the principal reasons given for this disappearance is said to be their liability to attack and capture by river pirates and to the invasion of steam craft, the latter owned and operated by foreign firms and such foreign ownership, combined with their greater speed, making them more immune from attack.

It seems to be generally regretted, from historical and picturesque points of view, that these interesting vessels are giving away so rapidly, but it appears to be inevitable that they should make way for more modern craft, even as the old picturesque sailing vessels have given way to modern steam craft on the important trade routes of modern commerce.

Thomas Sammons,  
Consul-General  
Shanghai, China.



A commercial motor boat under construction in the plant of the Dachel-Carter Boat Co., at Benton Harbor, Mich. This company is specializing on boats from 65 to 200 feet in length

## Missouri Oil Engines

The Missouri Engine Co., of St. Louis, Mo., have recently issued a booklet on oil engines in general and Missouri engines in particular. It takes up and explains in detail the advantages and disadvantages of the different types of oil engines, the principles upon which they operate, and the necessary auxiliary equipment for each.

As these motors operate on the cheaper grades of oils, they save from fifty per cent. to seventy-five per cent. on the fuel bill when compared to the cost of running on gasoline. With the present high price of gasoline this would mean that the saving in one year's time would pay for the engine. Owners of commercial boats that are in service every day should be particularly interested in the rugged construction and reliable operation of these motors.

## A Gray-Prior Powered Fishing Boat

Totem, 48½ feet long by 13½ beam, sailing from Portland, Me., is powered with a Model D4, 36 h.p. four-cycle Gray-Prior motors. This engine turns a 26 by 26-inch three-bladed Hyde propeller at 595 r.p.m. giving a speed close to 10 m.p.h. This successful fishing boat is owned by Capt. Gus. Doughty, of Cheabesque, Me., and averages ten hours running every day of the year.

The Gray & Prior Machine Co., of Hartford, Conn., have recently made a shipment of their Model D4, 36 h.p. motors to Cheva, Alaska, where they will undoubtedly be as successful as they have been along the coast of Maine and Nova Scotia.

## Old Time Motorship

Early in February the little British motorship Huia drifted into San Francisco port and set the tongues of seafaring men a-wagging over her unusual rig. Built twenty-seven years ago at Gosport, she is what is known as the old British type of top-sail schooner with fore-and-aft foresail and double square topsail above. Seventeen years ago she visited San Francisco and had installed one of the first of the large marine engines built by the Union Gas Engine Company. The two cylinders of the engine are gigantic affairs and are set at an angle, both working on a single crank pin. The engine developed 60 H.P. and was considered something of a wonder at the time it was installed. Two years ago an ingenious mechanic at Auckland, the vessel's home port, converted her into a kerosene burner, and the old engine is still working well.

## New Orleans Dry Dock Electrified

Electric motors have recently been installed by S. J. Stewart to operate the pumps on the four-section dry dock of the New Orleans Dry Dock and Shipbuilding Company.

This dock was formerly operated by hand and required the services of sixty-four men at an average wage of twenty-five cents per hour. The best time made with the hand pumps was two hours for a small vessel, at a cost of thirty-two dollars for labor.

The same pumps, of the old style sucker type, now operate by electric motors will make a lift in thirty minutes at a cost of about three dollars for power. This is not only a very direct material saving but with the present scarcity of labor allows operation with a much smaller force. There is also a great saving in time, valuable to both the shipowner and builder.

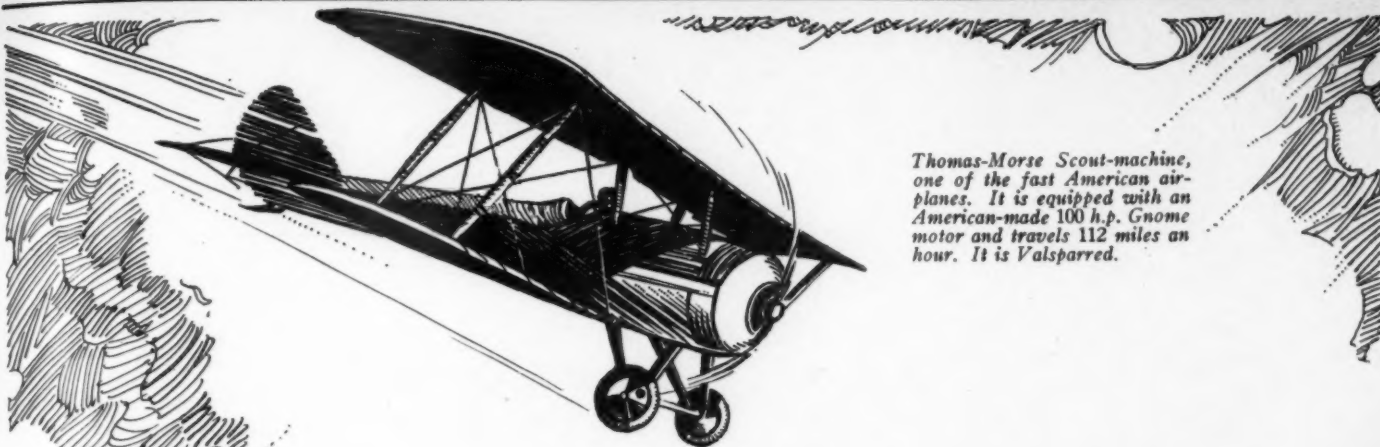
## A Breath from the South Seas

The 88-ton motor schooner Yaobel May came into San Francisco harbor on the tide early in February, bringing with it the fragrance, mystery and romance of the Southern Cross. The little vessel belongs to Father Bouquier, who rules over the Christmas Islands as the padre of old Spain ruled the missions of early California. The good priest is alive to the progress of the world and some time ago he had the schooner fitted out with an 80 h.p. Union gas engine. On her present trip, Captain Begole, who is returning to his native France to rejoin the navy, acted as skipper.

## River Motorboats for Business

The development of river transportation in California by means of motor-driven vessels took an important stride this month when the Inland Transporting Co., of Stockton, gave orders for ten motor vessels to be built immediately at the Stephen Shipyards of that city.

The new boats are designed especially for carrying passengers on the San Joaquin River, although some express matter and light freight will be transported. Each boat is 62x14 feet, with a slight draft to carry them over the shallow places. Twin 92 h.p., six-cylinder Wisconsin engines will operate on twin screws and a speed of from 18 to 22 miles will be maintained.



Thomas-Morse Scout-machine, one of the fast American airplanes. It is equipped with an American-made 100 h.p. Gnome motor and travels 112 miles an hour. It is Valsparred.

**I**N the air-fleets of the Allied Governments, Valspar has proved its supremacy as the most reliable and durable varnish for wood, metal, and fabric.

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Curtiss Flying-boat, triple-motored, the largest in the world. This type is used by the British Navy in coast-patrol work. The Curtiss is Valsparred.

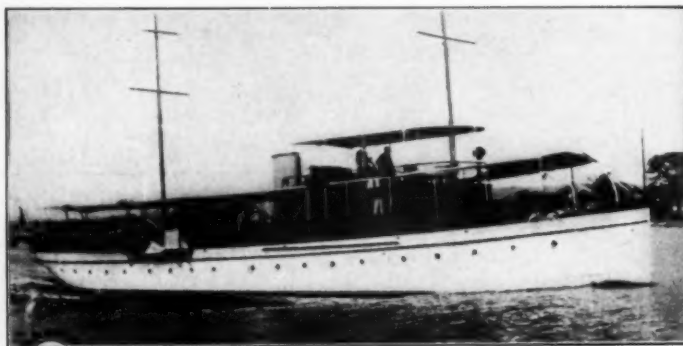
Naval Architects  
and  
Yacht Brokers

# COX & STEVENS

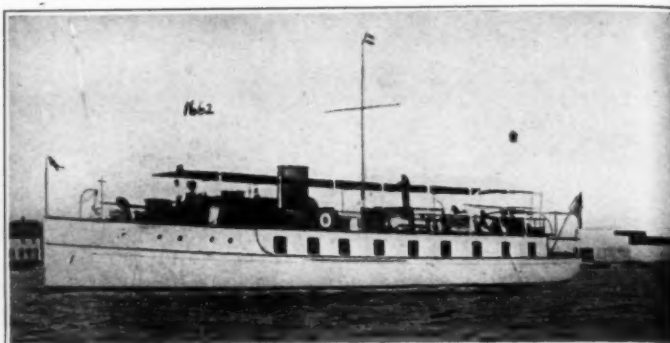
15 William St., New York  
Telephone—1375 Broad  
Cable—BROKERAGE

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.

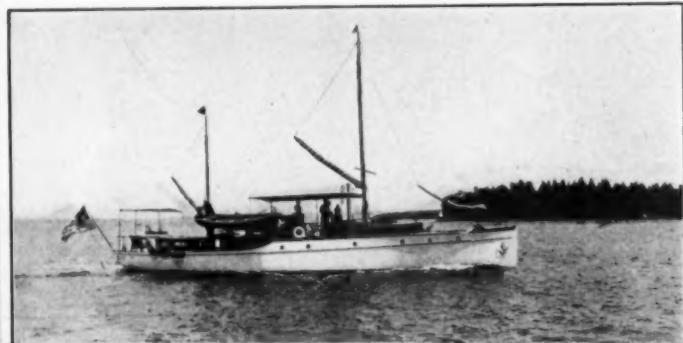
**WINTER CHARTER**—We specially offer several modern GASOLINE HOUSEBOATS particularly adapted for FLORIDA waters.



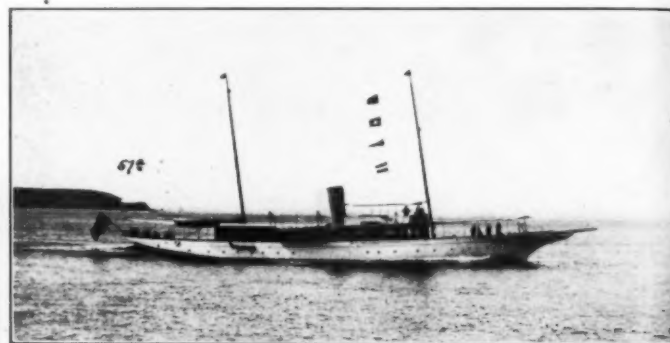
No. 1796—For Sale or Charter—Very roomy, twin screw cruising power yacht, 99 x 17 x 4 ft., adapted for Florida service. Speed 12-14 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms; all conveniences. Cox & Stevens, 15 William Street, New York.



No. 1662—For Sale or Charter—Attractive 90 ft. twin screw gasoline houseboat; speed 10-12 miles. Large saloon, four staterooms, two bathrooms; all conveniences. Handsomely furnished. Cox & Stevens, 15 William Street, New York.



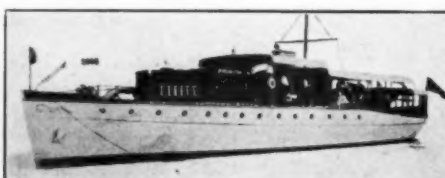
No. 2547—For Sale—Attractive gasoline cruiser; 64 x 12.6 x 4 ft. Built 1913. Speed 11-12 miles. Best construction. Main saloon, and toilet room forward; two staterooms, bathroom, etc. aft. Price low for immediate disposal. Cox & Stevens, 15 William Street, New York.



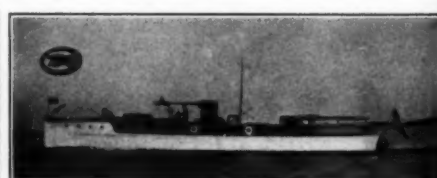
No. 57—For Sale—Fast, steel, steam yacht; 145 x 17.3 x 7 ft. Speed 16 miles. Deck dining saloon, three staterooms, two bathrooms, etc. Handsomely finished and furnished. Fine condition. Estate anxious to sell. Cox & Stevens, 15 William Street, New York.



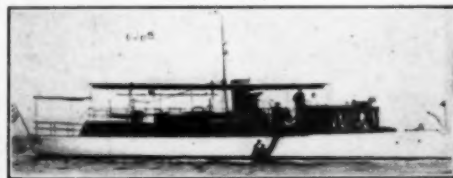
No. 2020—For Sale—110 ft. steel twin screw cruising power yacht; speed up to 15 miles. Large accommodation; dining saloon and social hall on deck; six staterooms, two bathrooms, etc., aft. Large cruising radius. Cox & Stevens, 15 William Street, New York.



No. 2888—For Sale—Twin screw Diesel power yacht; 110 x 18 x 6 ft. Speed 12-14 miles; two 150 H.P. 6 cylinder Craig-Diesel motor. Dining and main saloons; four staterooms, bath, four toilets, etc. Very economical to operate. Cox & Stevens, 15 William Street, New York.



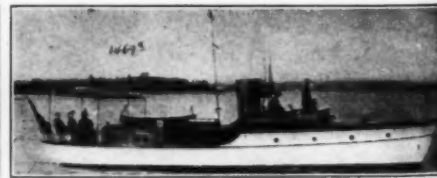
No. 3495—For Sale—Practically new, roomy high speed cruiser (similar to photo); 76 x 13 x 3.6 ft. Speed up to 23 miles. Dining saloon and galley forward; two double staterooms, bath and two toilets aft. Handsomely finished and furnished. Large bridge and cockpit space. Cox & Stevens, 15 William Street, New York.



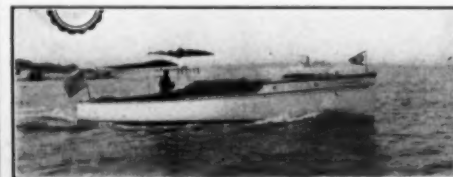
No. 1130—For Sale—Roomy and able gasoline cruiser, 70 x 13.6 x 3.6 ft. Speed 11-13 miles; 6 cyl. Winton motor. Dining saloon, three staterooms, bath, main saloon, etc. Low figure accepted.



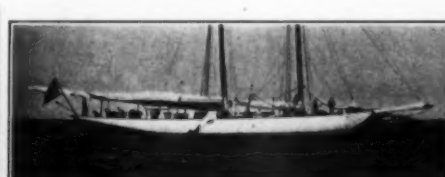
No. 3529—For Sale—Fast, up-to-date 60 ft. bridge deck cruiser. Speed 18 miles; 8 cylinder Van Blerck motor (new 1917). Double stateroom, saloon, large galley, etc. Cox & Stevens, 15 William Street, New York.



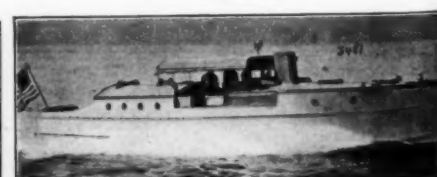
No. 1469—Bargain—Modern bridge deck cruiser; 52 x 11 x 4 ft. draught; 32/37 H.P. Standard Motor; speed 11 miles. Double stateroom, saloon, galley, toilet room, etc. Interior finish African mahogany. Cox & Stevens, 15 William Street, New York.



No. 3563—For Sale at Low Figure—Smart, fast 40 ft. power cruiser. Speed up to 18 1/2 miles; 100/125 H.P. 6 cyl. Van Blerck motor (new 1917). Good cabin accommodation; cockpit about 18 ft. long. Exceptional opportunity. Cox & Stevens, 15 William Street, New York.



No. 906—Sacrifice—Flush deck, keel auxiliary schooner yacht; 95 x 68 x 20.6 x 10 ft. Large saloon, three staterooms, bath, two toilets. Speed under power 7 miles. Cox & Stevens, 15 William Street, New York.



No. 3481—For Sale—Practically new, high speed bridge deck cruiser; 50 x 11.3 x 2.9 ft. Speed up to 24 miles, 200 H.P. Van Blerck motor. Double stateroom, saloon, electric lights, etc. Handsomely finished. Cox & Stevens, 15 William Street, New York.

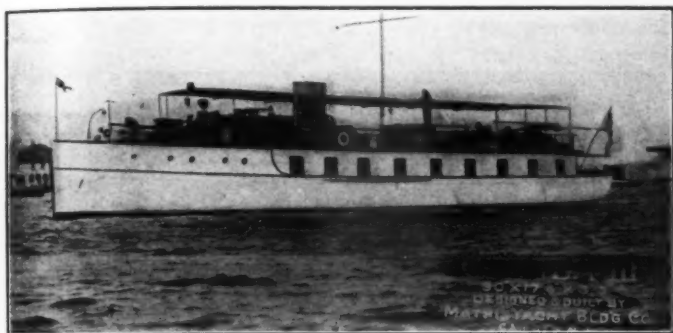
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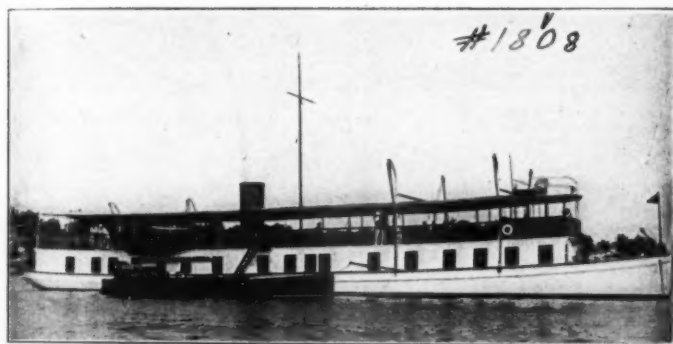
Offer for charter the following desirable houseboats all of which are admirably suited for Florida waters



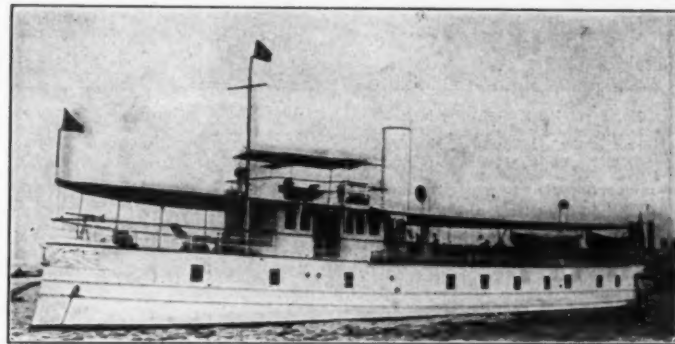
No. 1865—Exceptional opportunity to charter one of the best houseboats available. 90 ft. over all, 17 ft. 6 in. beam and 3 ft. 6 in. draft. 3 staterooms, maid's room, 4 bathrooms and dining saloon.



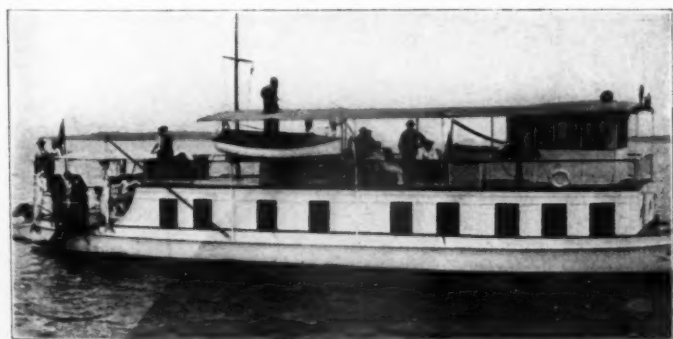
No. 1820—Charter—Desirable houseboat in southern waters, 103 ft. x 20 ft. 4 in. x 3 ft. draft. 4 staterooms, 2 bathrooms, dining saloon and large sitting room.



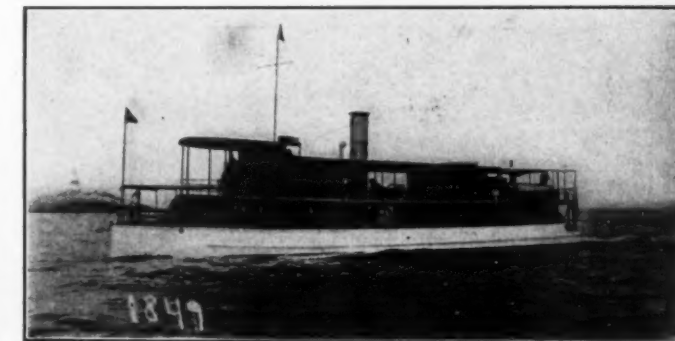
No. 1808—Sale—Charter—Now at Miami. Admirably suited for Florida waters. 125 ft. x 17 ft. 8 in. x 3 ft. 4 in. draft. 4 staterooms, 2 bathrooms, very large dining saloon, ice machine, etc.



No. 243—Sale—Charter—Twin screw steam houseboat, 116 ft. x 21 ft. x 4 ft. draft. 4 staterooms, 3 bathrooms, dining saloon and smoking room.



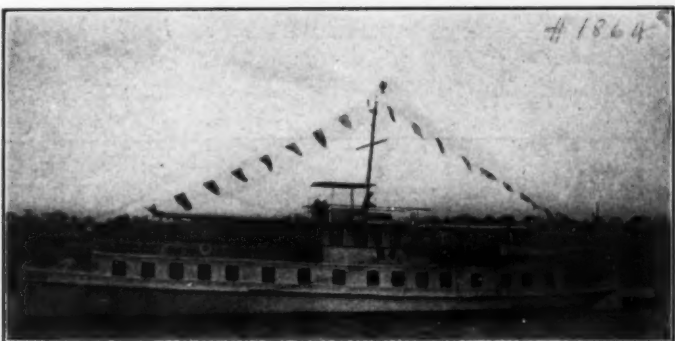
No. 1860—Charter—Shallow draft twin screw houseboat, 70 ft. x 18 ft. x 6 in. x 18 in. draft. 3 staterooms, bathroom, dining saloon and pilot house.



No. 1849—Charter—Desirable houseboat, 115 ft. x 17 ft. x 3 ft. 6 in. draft. Speed 12 miles. 5 staterooms, 3 bathrooms, main saloon, dining saloon, smoking and sitting rooms.



No. 1847—For Charter—Houseboat now in Florida waters, 85 ft. x 18 ft. x 28 in. draft. 4 staterooms, bathroom, large dining saloon, sitting room, etc.



No. 1864—Charter—Now in Florida waters. Modern houseboat, 110 ft. x 20 ft. x 4 ft. 9 in. draft. 4 Staterooms, dining saloon, sitting room, etc.

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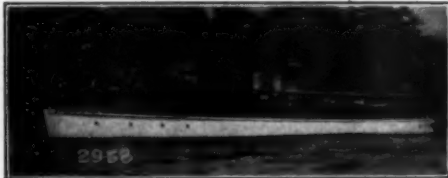
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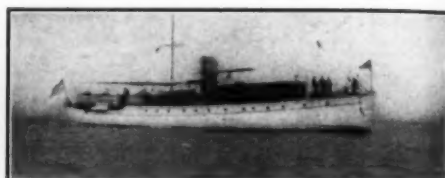
We have a most complete and up-to-date list of steam yachts, power yachts of all sizes, sail, auxiliary and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request. FOR SOUTHERN CRUISING this Winter we offer a number of very desirable POWER HOUSE BOATS and POWER YACHTS which are specially adapted for FLORIDA waters. Last season a great number of clients were much disappointed in not being able to secure for charter a suitable POWER HOUSE BOAT or POWER YACHT owing to the great demand. Yachting this coming WINTER SEASON promises more activity than ever before—so—CHARTER A BOAT NOW AND BE ASSURED OF ONE THIS WINTER. We can render invaluable assistance in expert appraisals, supervision of alterations and estimates.



No. 2958—For Sale—High grade express steam yacht. 120 feet. Twin screw. Speed up to 24 miles. In fine shape. Gielow & Orr, 52 Broadway, New York City.



No. 5488—For Sale—64 foot express cruiser. In excellent condition. Can be purchased at bargain. Act quick. Make inspection immediately. Gielow & Orr, 52 Broadway, New York City.



No. 4591—For Sale—126 foot twin screw steel motor yacht. Most successful cruiser. Designed by us. Five staterooms. Speedway engines. Gielow & Orr, 52 Broadway, New York City.



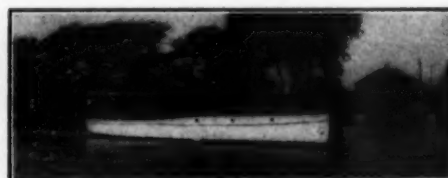
No. 4331—For Sale—Lawley built 68 foot twin screw power yacht. Mahogany and butternut interior finish. Two staterooms. Gielow & Orr, 52 Broadway, New York City.



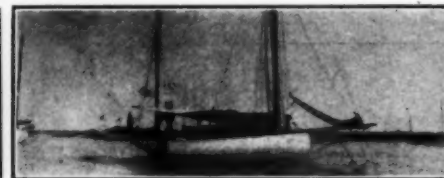
No. 3710—For Sale—Popular twin screw off shore cruiser. 99 foot by 17 foot by 4 foot. Standard motors. Six staterooms, three bathrooms. Gielow & Orr, 52 Broadway, New York City.



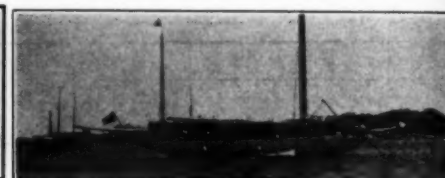
No. 1603—For Sale—Auxiliary keel schooner. 69 foot overall. 45 foot waterline. 15 foot beam. 9 foot 6 inches draft. Two staterooms. Flush deck and cockpit. Gielow & Orr, 52 Broadway, New York City.



No. 5969—For Sale—Built 1917. Handsome 65 foot motor yacht. Sterling engine. Two staterooms, bathroom. Mahogany finish inside. Gielow & Orr, 52 Broadway, New York City.



No. 2841—For Sale—Auxiliary centerboard yawl. 35 feet overall. 30 feet waterline. 12 feet beam. 3 feet 3 inches draft. In excellent condition. Sterling engine. Gielow & Orr, 52 Broadway, New York City.



No. 706—For Sale—Most attractive 71 foot auxiliary keel yawl. Sails new 1916. Fast sailer. Three staterooms. Price reasonable. Gielow & Orr, 52 Broadway, New York City.



No. 6053—For Sale—Handsome 75 foot twin screw motor yacht. Built 1917. 20th Century motor. Mahogany and white. Three staterooms. Gielow & Orr, 52 Broadway, New York City.



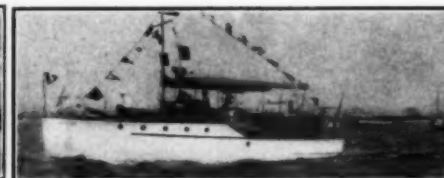
No. 5951—For Sale—High grade 40 foot express cruiser. Hand V bottom. Speed up to 23 miles. Van Blerck engine. Gielow & Orr, 52 Broadway, New York City.



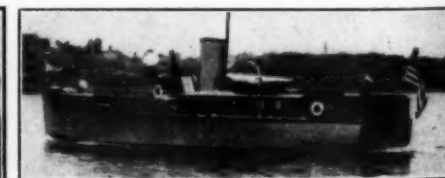
No. 5957—For Sale—This popular 51 foot raised deck motor yacht. Elco build 1917. Sterling engine. Private stateroom. Gielow & Orr, 52 Broadway, New York City.



No. 5616—For Sale and Charter—Finest kept up 122 foot steel steam yacht. Triple expansion engines. Five staterooms. Two bathrooms. Worth investigating. Gielow & Orr, 52 Broadway, New York City.



No. 6049—For Sale—This fine little 38 foot cruiser. Can be purchased right. Private stateroom. Buffalo motor. Gielow & Orr, 52 Broadway, New York City.



No. 5980—For Sale—This 60 foot express yacht built 1917. Equipped with Sterling engine. Speed up to 16 miles. Gielow & Orr, 52 Broadway, New York City.



No. 5225—For Sale—52 foot flush deck cruiser. Standard motor. Private stateroom. Bathroom. Excellent proposition. Estate must be settled. Gielow & Orr, 52 Broadway, New York City.



No. 6061—For Sale—50 foot Luders build raised deck cruiser. Van Blerck engine. Most attractive proposition. Gielow & Orr, 52 Broadway, New York City.



No. 235—For Sale—66 foot auxiliary centerboard yawl. Two staterooms. Sterling engines. Inspection invited. Gielow & Orr, 52 Broadway, New York City.

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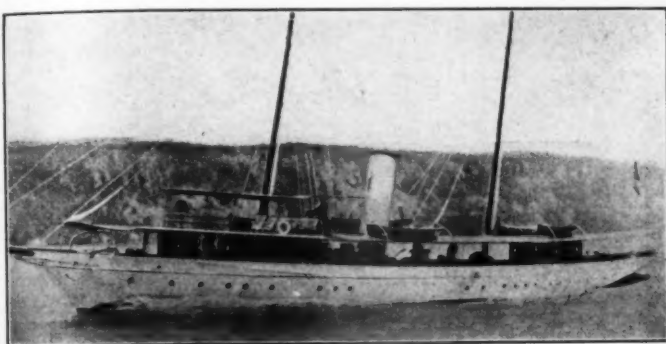
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1 BROADWAY, NEW YORK

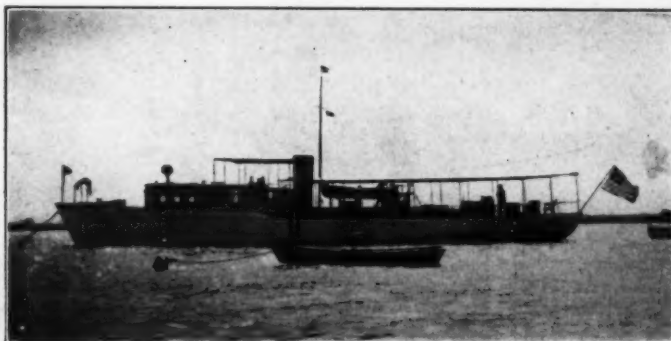
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We have a complete list of Yachts of every description for sale and charter.

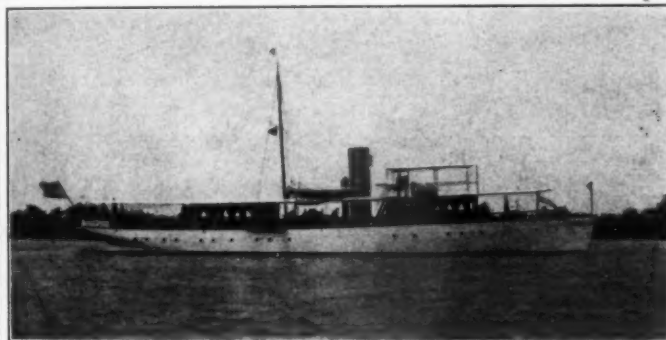
Plans, Photos and full particulars furnished on request



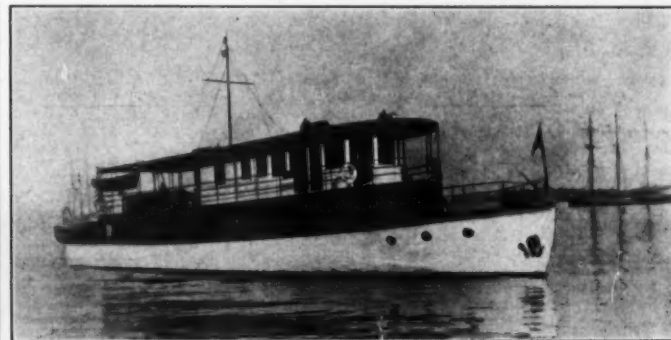
No. 238—For Sale—Steel steam yacht, 170' x 21' x 8' draft. Large dining saloon, social hall and smoking room on deck; 5 staterooms, 3 bathrooms, etc. Completely equipped.



No. 1081—For Sale—Twin screw, 90 ft. power yacht; splendid accommodation. Recently overhauled and 2 new Standard engines, 4 cylinder, 75 h.p. each, installed 1916. Exceptionally able and fully found.



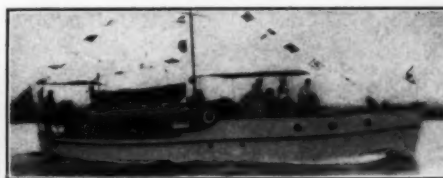
No. 646—For Sale or Charter—Steam yacht 123 ft. x 17 ft. x 6 ft. draft. 5 staterooms, 3 bathrooms. Dining saloon and social hall on deck.



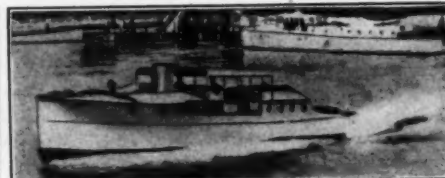
No. 85—Sale, Charter—Florida waters, houseboat, 85' x 18' x 30" draft; 100 h.p. Sterling engine. Large social hall, 3 staterooms, bathroom, etc.



No. 1937—Diesel Power Yacht, 110 x 18, two 6 cylinder 150/180 H.P. engines, low fuel cost.



No. 2355—Bridge deck cruiser, 45 x 9.6, Lamb motor, 24 H.P.; quick sale desired.



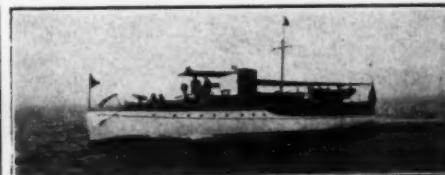
No. 2314—Express cruiser, 50 x 11.5, Van Blerck 200 H.P. motor, speed 22 miles.



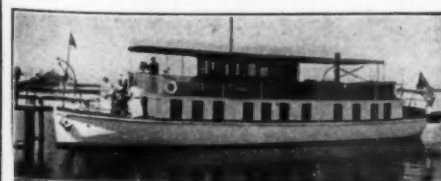
No. 2386—New Patrol type, 54 x 11.2, eight cylinder Van Blerck, speed 17 miles.



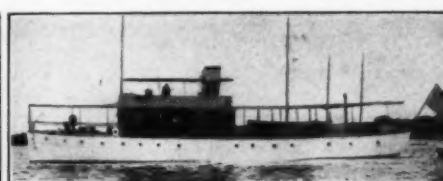
No. 2358—New Express Cruiser, 45 ft., eight cylinder, 200 H.P. Van Blerck, speed 22 miles.



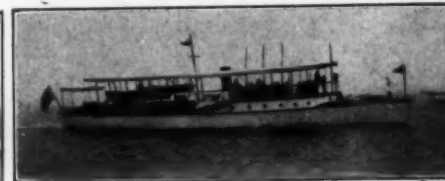
No. 1738—Raised Deck Cruiser, 65 x 11, six cylinder motor, good accommodation.



No. 37—Offered by Estate—Florida waters—70 ft. shoal draft houseboat, two Sterling motors, three staterooms, etc.



No. 1821—Flush Deck Power Yacht, 90 x 15.5, two 60 H.P. motors, 3 staterooms, etc.



No. 924—Power Yacht, 92 ft., 100/125 H.P. 20th Century motor, splendid deck space.

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HENRY H. JENNINGS

HERMAN JAGLE

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Telephones  
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AMERICAN AND FOREIGN YACHTS

Merchant Vessels for Sale and Charter

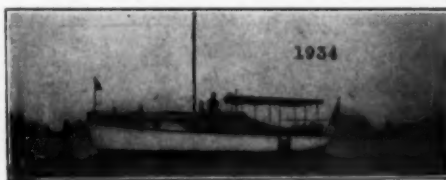
No. 1 Broadway

New York City

Surveying  
Marine Insurance

*Our list comprises all the available yachts for sale and charter. Below are a few of our offerings. If none of these appeals to you, write us your requirements. Our knowledge of the yachts we offer, and our 25 years' experience in the business, insure satisfaction to any one buying or chartering a yacht through this office.*

SEND FOR OUR CATALOGUE



1934—32 foot cruiser. Sleeps four. 18-25 H.P. Sterling motor. Price attractive.



4241—38 foot Auxiliary Keel Yawl. Two staterooms, main cabin, etc. 40 H.P. Sterling motor. Lead Keel. Price very attractive.



4217—75 foot steam yacht. Strongly built. Good condition. Speed 10-12 knots. Suitable for commercial purposes. Price attractive.



2376—75 foot steam yacht. Eight staterooms, social hall, dining saloon, main saloon, baths, etc.



1935—38 foot cruiser. Good accommodations. 18-35 H.P. Sterling motor.



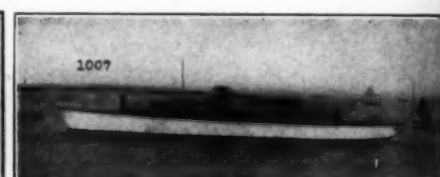
1399—43 foot cruiser. Sleeps five. Speed 10-11 miles.



1941—52 foot houseboat cruiser. Large saloon and double stateroom, etc. Speed 9 miles.



4256—107 foot power houseboat; built 1918. Six staterooms, dining saloon, living room, four bathrooms, etc.



1007—80 foot cruiser. Two staterooms, saloon, etc. Speed 12-14 miles.



1182—55 foot Express Day Cruiser. Speed 22 miles. Bargain.



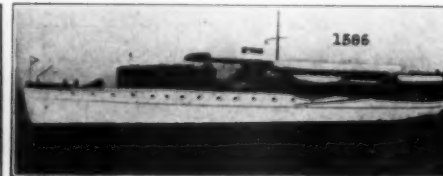
1915—53 foot cruiser. Splendid accommodations. Speed 12-14 knots.



1940—65 foot cruiser. Three double staterooms, saloon, bath, etc.



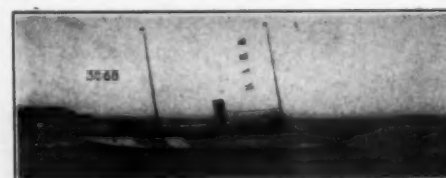
1924—90 foot twin screw power yacht. Three staterooms, dining saloon, bath, etc. Speed 14 miles.



1586—110 ft. power yacht. Twin screw. Four staterooms, saloon, bath, etc. Speed 16 miles.



1389—90 ft. power yacht. Twin screw. Three staterooms, saloon, bath, etc. Speed 12-14 miles.



3068—150 foot steel steam yacht. Splendid accommodations. Speed 18 miles.



1913—55 ft. express cruiser. Stateroom, saloon, etc. Speed 17 miles.



1925—50 foot express cruiser. Double stateroom, saloon, etc. Speed 22-24 miles.

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# FRANK BOWNE JONES, Yacht Agent

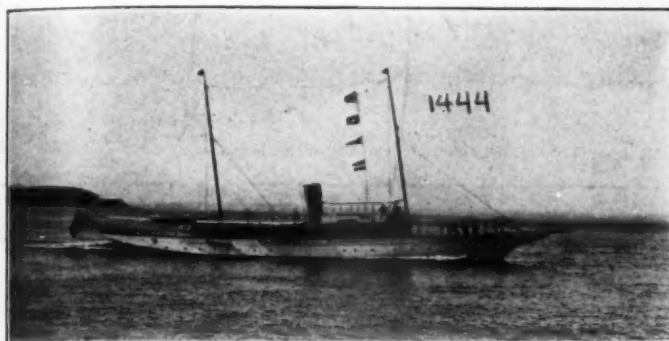
Cable Address "Windward," N. Y. **29 Broadway, New York** Telephone, Whitehall 480

High-Class Yachts of all types for sale and charter

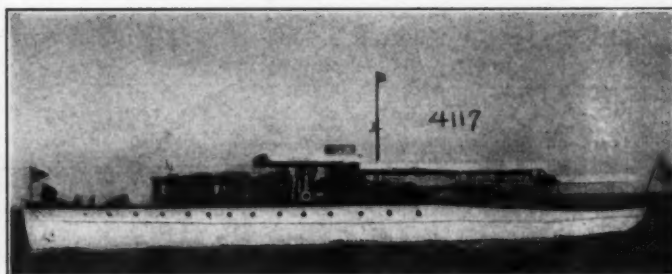
NAVAL ARCHITECTURE

Description, Prices on Request

MARINE INSURANCE



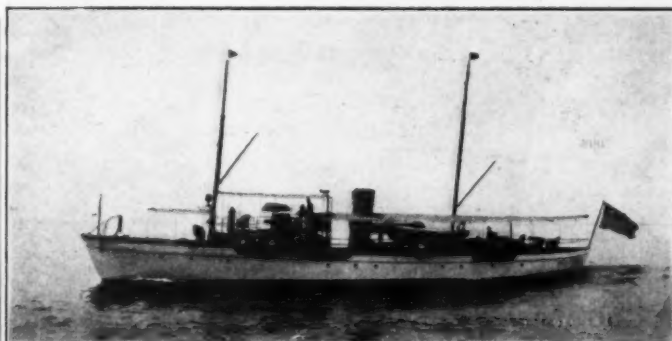
No. 1444—For Sale—Steel Steam Yacht. Length 145 ft.; of best design and build and in A-1 condition; speed 16 knots. Frank Bowne Jones, Agent, 29 Broadway, New York.



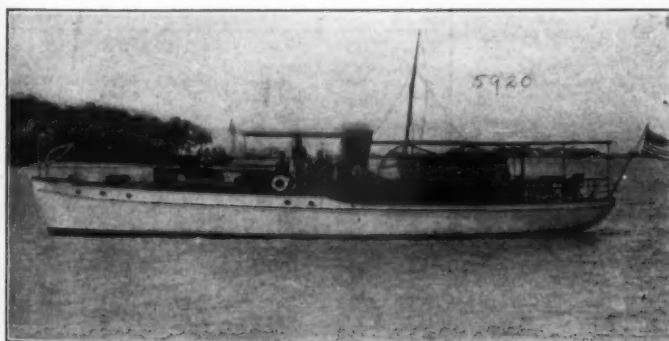
No. 4117—Sea Going Power Yacht. Length 110 ft.; twin screw; two Diesel engines; excellent accommodations; desirable vessel in every way. Frank Bowne Jones, Agent, 29 Broadway, New York.



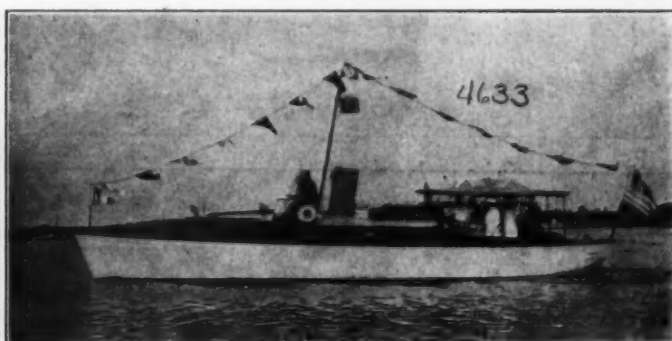
No. 5510—Twin Screw Gasoline Cruiser. Length 83 ft.; Lawley build; an excellent yacht at a reasonable price. Frank Bowne Jones, Agent, 29 Broadway, New York.



No. 3101—For Sale—Probably the best Gasoline Yacht of her size; condition good as new; reasonable price; especially adapted for the Outside Patrol Service as well as for general yachting service. Length 96 ft.; beam 14 ft.; draft 4 ft. 9 in.; flush deck; twin screw; new Sterling engines; 15 miles speed; Lawley build. Frank Bowne Jones, Yacht Agent, 29 Broadway, New York. Yachts of all types for sale and charter.



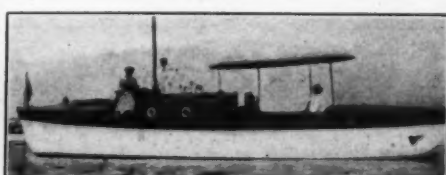
No. 5920—Gasoline Cruiser. Length 66 ft.; accommodations include 2 staterooms, dining saloon and bath; 6 cylinder Standard motor. Frank Bowne Jones, Agent, 29 Broadway, New York.



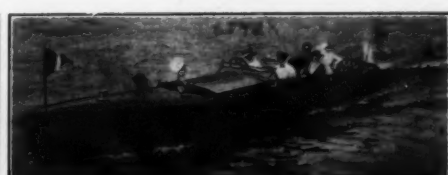
No. 4633—Gasoline Cruiser. Length 44 ft.; Trunk Cabin type; bridge control; best design and build. Frank Bowne Jones, Agent, 29 Broadway, New York.



No. 3380—Express Cruiser. Length 55 ft.; built last year; 8 cylinder Duesenberg motor; speed 28 miles; attractive price; best boat of the type. Frank Bowne Jones, Agent, 29 Broadway, New York.



No. 4549—Gasoline Cruiser. Length 37 ft.; double cabin type with intermediate cockpit; double stateroom and saloon; new or without motor; low price. Frank Bowne Jones, Agent, 29 Broadway, New York.



No. 6593—Fast Runabout. Length 35 ft.; Elco Express; with or without motor; low price. Frank Bowne Jones, Agent, 29 Broadway, New York.

## THE MoToR BOATING MARKET PLACE

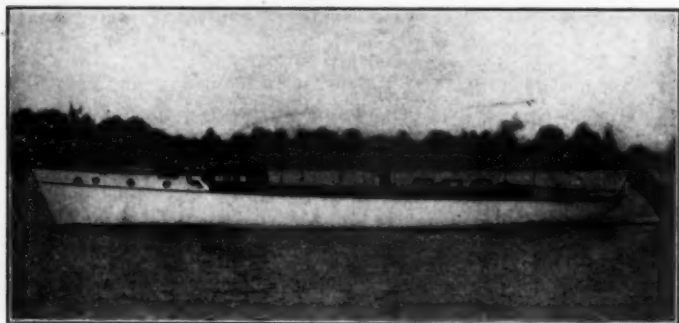
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 Cut one inch deep, one column wide..... \$2  
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### Opportunities for the Motor Boatman

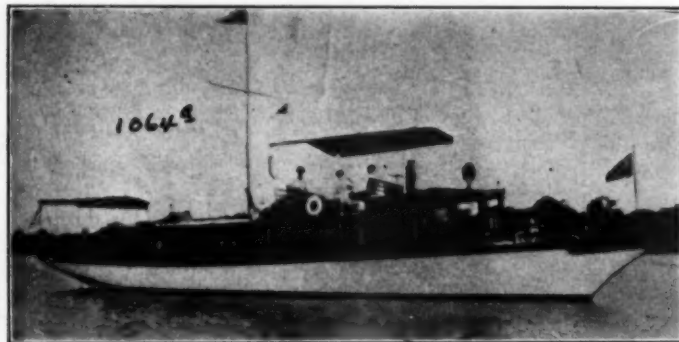
Before you buy or before you sell examine the exceptional buying and selling opportunities under the heading. They comprise the best offer of the month. Please mention MoToR Boating.



FOR SALE—Snappy runabout designed by Wm. H. Hand, Jr. Two years old. Twenty feet. Not strained or leaky. Four cylinder 22 horse Loew-Victor motor with Bosch dual ignition. Reverse and rear starter incorporated in base. \$600 cash. E. A. DeWolf, South Dartmouth, Mass.



Day Cruiser "Sunbeam," 26 x 9 x 3. Built 1909. Robt. Jacob, 20th Century motor. Price \$4500. McIntosh Yacht Agency, 32 Broadway, New York City.



WANTED—Good 25 foot runabout. Must be of the highest type. C. H. Weil, 225 W. Randolph St., Chicago.

FOR SALE—60 h.p. Six Cylinder finest make IMPORTED FRENCH engine, aluminum base, GUARANTEED perfect condition, Paragon Reverse Gear weight 1100 lbs. Outfit used last season only in 50 foot Cruiser. Bargain price complete with Propeller \$400.00. Address Box 451, New York Athletic Club, New York City.

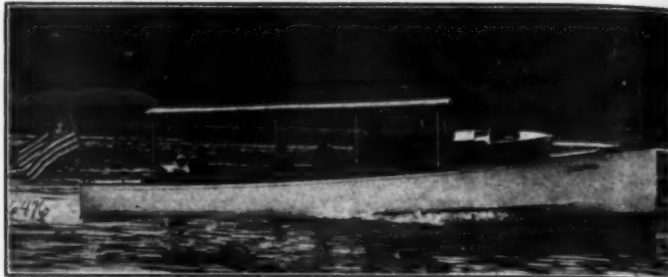
A fine seagoing raised deck cruiser 30 ft. x 8 ft. 6 in. 4 cyl. 4 cycle motor, hardwood interior, toilet, galley, 2 refrigerators, running water and wardrobe. 10 M.P.H. complete. \$800.00. Broun, 29th, Camden, N. J.

FOR SALE—20th Century engine, 40-50 h.p. Perfect condition. M. Gully, 455 40th St., Brooklyn, N. Y.

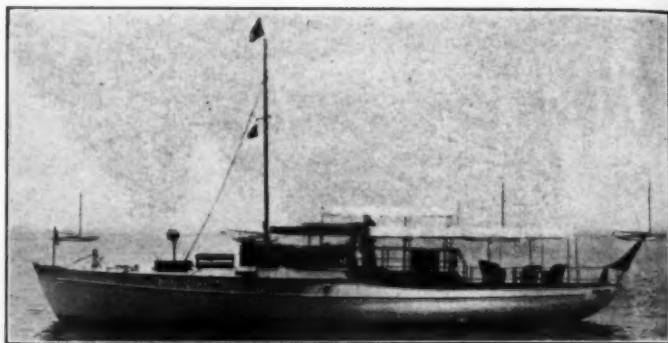
#### GENUINE BARGAINS

One 15-28 H.P. 4-cyl. 4-cycle Fay & Bowen Engine, 4 in. bore, 5¼ in. stroke, Bosch magneto; Fay & Bowen reverse gear; used less than two months. Guaranteed equal to new. Price, \$600.  
 One 30-45 H.P. 4-cyl. 4-cycle Fay & Bowen Engine, 5 in. bore, 6¼ in. stroke; same equipment as above; perfect condition. \$900. Marine Equipment & Supply Company, 610 Arch Street, Philadelphia, Pa.

FOR SALE—Bargain—48 foot cruiser. Brand new. Never used. Sell less than half cost. Six cylinder engine. Electric lighting and starting. Bishop, owner, 10308 Clifton Blvd., Cleveland, Ohio.



No. 6476—Fast Day Cruiser; built by Seabury Company; less than two years old and good as new. Dimensions 18 x 8.3 x 2.9; 6 cylinder Speedway motor; speed 20-24 miles. FRANK BOWNE JONES, Yacht Agent, 29 Broadway, New York.



"TAROLINTA," 60 x 11.6 x 3.3. Built 1907, 6-cylinder Standard motor. Immediate delivery \$6500. McIntosh Agency, 32 Broadway, New York City.

No. 1064—Offer wanted—Particularly desirable motor yacht; 63 x 12.6 x 3.10 ft. Speed 11-13 miles; 50/54 H.P. 6 cyl. Standard motor. Accommodations for six on berths in pilot house and large saloon. Mahogany finish throughout. Independent electric lighting plant. Large deck space. Cox & Stevens, 15 William Street, New York.

One 20-ft. Cedar-Mahog. Runabout 30 H.P.  
 One 25-ft. Cedar-Mahog. Runabout 30 H.P.  
 One 20-ft. Cedar and Mahogany hull.  
 One 18-ft. White Pine and Cedar hull.  
 One 6-cylinder 65-H.P. Sterling motor.  
 One 6-cylinder 60-H.P. Scripps motor.  
 One 4-cylinder 40-H.P. Pope motor.  
 One 6-cylinder Winton motor.

R. C. PRICE & CO., Motor Boat Builders,  
 Foot of Federal Street, N.S., Pittsburgh, Pa.

FOR SALE—27-ft. hunting cabin cruiser; 4 cycle, 4 cylinder Deman. All in perfect condition. Full details by mail. Can be thoroughly inspected. W. F. BROWN, 291 Sound View Ave., Stamford, Conn.

RUNABOUT For Sale—Handsome 30 ft., semi-speed runabout, practically new, mahogany finish; a real boat for rough weather; 4-cycle, 4-cylinder Van Blerck engine, 40-50 h.p., Bosch dual; speed 21 miles; built by Kretzer Boat Co., New York. Charles T. Lamb, 91 Reid Ave., Brooklyn, N. Y.

FOR SALE—Baker 3-inch liquid compass, in binnacle box with lamp attachment. Address N. Carrier, 33, Buffalo, N. Y.

FOR SALE—Two-cylinder, two-cycle 16 h.p. Lathrop engine with Joes reverse gear. Engine in good condition, reverse gear new last summer. Inquire at Colonial Boat Shop, 140th St. and Hudson River, New York City.

FOR SALE—45-65 Sterling, Medium Duty, just overhauled, in perfect shape. Owner going to France will sell at two-thirds value. Box 15, MoToR Boating.

Illustrated Boating list for 10c. New and second-hand illustrated engine list, for 10c. Owners' free listing blanks. Canadian Boat & Engine Exchange, Toronto.

FOR SALE—5 ft. twin, 2 cycle copper jacket marine motor. New high tension magneto. First class running condition. Bargain at \$80 for quick sale. W. Hyde, 1608 Jefferson St., Waterloo, Iowa.

#### SELLING OUT FOR CASH.

Boats, equipment and stock, including a 25 x 50 ft. float, motor boats, sail boats, railways and cars, propellers, bronze halfting, life preservers, lights, etc. Accessories of all kinds must be sold before May first at Sickels Boat Works, Red Bank, N. J. No letters answered. Call and pick out what you want, the prices are not worth considering. Ralph B. Sickels, East Front Street, Red Bank, N. J.

BARGAIN For Cash—Racine Hunting Cabin Cruiser, 39 ft. 5 in. by 8 ft. 6 in. Complete cruising inventory. Sleeps 6. Write for print picture, inventory, specifications, etc. H. S. Nelson, P. O. Box 212, Muskegon, Mich.

FOR SALE—A pair of heavy duty 4 cyl. 4 cycle 20th Century motors, 75 h.p., in perfect mechanical order, with all latest improvements. Box 12, MoToR Boating, 119 West 40th St., City.

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## MoToR Boating

sells you something more than twenty-five words for your seventy-five cents. Results and plus results all for seventy-five cents—And just bear this in mind—MoToR Boating will give you more for seventy-five cents than several times seventy-five cents will buy in any other magazine.

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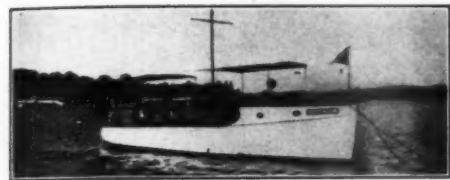
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## Opportunities for the Motor Boatman

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**FOR SALE**—36-ft. mahogany runabout designed by Wm. Gardner. Engine Wisconsin 40-50 H.P. with auto wheel and control. Rayfield carburetor, Bosch dual ignition; Hyde propeller. Two auto seats behind windshield; two arm chairs and cross seat in stern. Full equipment including auto top with side curtains, windshield, etc. Dry and seaworthy. T. Kilpatrick, 86 Kent Avenue, Brooklyn.



**FOR SALE**—36 ft. x 8 ft. x 2 1/4 ft. Bridge Deck Cruiser. 4 cyl. 4 cycle engine. Speed 8 miles. Sleeps 5. Fully found. A high class boat. Price low. H. M. Poole, 1715 84th St., Brooklyn, N. Y.

**BOSCH MAGNETOS**: 4 and 6 cylinder \$10.00 each. Low tension Magnetos \$3.50 each. Lighting Generators \$8.00 each. Schebler, Rayfield and Stromberg Carburetors \$5.00 and \$8.00 each. Auto Motors, air and water cooled, suitable for all purposes \$10.00 each and up. Write for new bulletin. Johnston, West End Pittsburgh, Pa.

**WANTED**—30-40—4 cylinder, 4 cycle motor, 1917-1918 Model, carrying new motor guarantee, weight not to exceed 650 lbs., Dual Ignition Magneto, generator, storage batteries, reverse gear, self starting device, bronze shaft, stuffing box, propeller. Full particulars in every detail with lowest cash price only entertained. Address by letter to Oberle, 238 East 42nd Street, New York City.

### CRANK CASE WANTED

If you have a second-hand crank case (lower half) for an old-style Loew-Victor four-cylinder engine, address Bates & Rogers Construction Co., Maysville, Ky.

**FOR SALE**—Runabout 26 x 4. Speed 15 miles. Fine sea boat. \$250. Also 12 h.p. Mianus \$85, good condition. F. Neucall, 780 McDonough St., Brooklyn, N. Y.

Colored man wishes position on cruiser for coming season; six years' experience, can make all ordinary repairs to engine, painting, carpenter work, etc., good cook, has full kit of mechanic's tools. Or would be janitor for yacht club. First class reference. Address Box 10, MoToR BoatinG.

Caretaker, Boatman, Shipkeeper—Elderly American couple desire a position as caretakers on a gentleman's estate or yacht; experienced boatman. Third winter with present employer. Address P. O. Box 94, Florham Park, N. J.

Raised Deck Cruiser, 38 1/2 x 7 1/2 x 3. Worth over \$2000 to build. Would take smaller cruiser or fast runabout and difference. Will send photo. George Winchester, 1109 Jefferson Ave., Grand Rapids, Mich.

### GUARANTEED REBUILT ENGINES.

The following engines are overhauled in our own shop and are guaranteed to be in good running order with equipment listed. These are engines we have taken in trade on new engines and can be bought at the following prices which we allow for them in trade:

**LATHROP**: 16 h.p. 2-cyl. 2-cycle. Make & Break ignition. Complete with electrical outfit, reverse gear, Schebler carburetor and propeller. \$250.00.

**GRAY**: 6 h.p. single cylinder. Complete with ignition outfit. \$60.00.

**BUFFALO**: 15 h.p. 4-cyl. Complete with reverse gear & Atwater-Kent ignition. \$275.00.

**VAN BLERCK**: 100 h.p. 6-cyl. 5 1/2 in x 6 in. Motor complete with carburetor and Paragon reverse gear, Bosch dual ignition. \$600.00.

**STERLING**: 20-35 h.p. 4-cyl. Complete with Bosch magneto, reverse gear, and other equipment. Used very little, practically as good as new. \$650.00.

Send for complete list of over thirty engines. An especially good chance to buy a re-built guaranteed engine at about one half to one third the cost of a new one. Walter H. Moreton, 214 State St., Boston, Mass.

A few medium and high speed, one, two, four and six cylinder, four-cycle marine motors, new or rebuilt. Reliance Motor Boat Co., 210th Street and Harlem River, New York City.

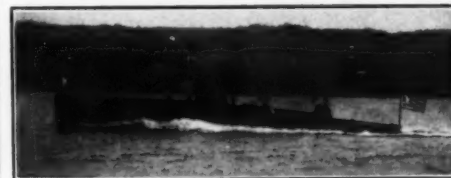
**FOR SALE**—Eight Cylinder 5 1/2 x 6 Sterling motor, complete with electric self-starter, condition guaranteed. Apply D. B. Roberts, 51 Elm St., Hartford, Conn.



**FOR SALE**—First deck cruiser "Aries"; thirty feet, eight feet beam, four cycle, twelve H.P. Lathrop motor. Full equipment, four spring bunks, galley with sink, toilet, fresh water tank. "Aries" three years old; motor new; owner has larger boat. Good bargain. GEORGE A. LANE, 209 Orange Street, New Haven, Conn.



**FOR SALE**—This handsome yacht 50 x 11, that cost to build \$12,000 and can be bought for \$1500. 28 to 40 H.P. Clifton 4 cycle engine. Very handsomely finished in paneled mahogany, completely fitted and in excellent condition. Can be seen at Ed. Keil, Glenworth Ave., North Beach, N. Y.



**FOR SALE**—Mahogany Speed Launch, 39 ft. 1 1/4 in. x 6 ft. Designed by Crane. Built by Leyare. 90 H.P. Buffalo motor. Speed 28 miles. Has had excellent care. In exceptionally fine condition. Wm. T. Morris, Penn Yan, N. Y.

**FOR SALE**—Flying Eagle hull, 16 ft. x 4 ft., mahogany, brass screw fastened, powered with 18-25 Pierce-Budd motor, Bosch magneto, safety rear starter, starter coil and Joes gear, built by Apel and launched last July. Speed 30 miles. Will be sold cheap before overhauling. Apply W. Palmer, 153 Franklin St., Brooklyn.

### DON'T SCRAP YOUR ENGINE ON ACCOUNT OF SCORED CYLINDERS OR POROUS HOLES.

We repair them by our Patented Process—fusing a silver and nickel alloy electrically without warping or enlarging the bore. Write to our nearest plant. L. Lawrence & Co., New York, 546 W. 45th St.; Detroit, 1246 E. Jefferson; Chicago, 1522 Michigan Ave.; Newark, N. J., 292 Halsey St.

**EXCEPTIONALLY** able 40 foot Cruiser 10 beam 3.2 draught, Stateroom and saloon sleeping six. Standard engine. Complete equipment, tender, compass, bell, lamps, signal flag, two anchors with chains, shipmate stove, large ice box, all cooking utensils, china, army blankets, all spring cushions, leather covered, toilet and bath, first class condition. For inspection write P. O. Box 223, Mt. Vernon, N. Y.

**WANTED**—Boat builders, cabinet makers, joiners, and good first-class house carpenters. Our shops are sanitary, well ventilated, steam heated and the working quarters are excellent. Port Clinton is located on the shore of Lake Erie, midway between Toledo and Cleveland, on the main line of the New York Central Railroad. Non-union shop. We offer good wages, steady work, and transportation will be refunded. Write us if you want a good job, with good pay. Matthews Boat Co., Port Clinton, Ohio.

**FOR SALE**—A YACHT OWNER'S HOME. A very attractive summer home, situated on Black Rock Harbor, with a most beautiful view of Long Island Sound. This home is built of granite blocks for the first floor, second floor shingled. Large windows and plenty of light and fresh air, city water, steam heat, gas and electric lighting, granite sea walls and fences, stone pier and yacht landing and best of anchorage. One large garage built of brick will hold 2 cars, work shop and place over head for help.

This home would make any yachtman WAKE UP and take notice. For further particulars inquire of Wm. S. Brandegee, Apt. 2-4 Seabright Ave., Bridgeport, Conn.

### OPEN FOR BIDS AND INSPECTION

**BARGAIN FOR CASH**—Raised deck cruiser, 38 feet, 20 H.P. Twentieth Century engine, complete cruising inventory, sleeps six. \$1,200. Landy, 50 Church St., N. Y.

Bosch Magnetos all models. Eiseman, Splittorf and Remy Magnetos always on hand. Also coils. Price list sent. D. B. Lenthe, Ordway Building, Newark, N. J.

**USE "SNAPPER" ENGINES** for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.



**FOR SALE**—Hacker 20 ft. Hydroplane. Mahogany. Powered with latest type Wisconsin Racing Motor. Construction and equipment throughout unusually substantial. This is a speed-boat that can be depended upon for continuous performance. Will do 40 miles per hour. In strictly first-class condition. Price \$1,400 for quick sale.

Charles M. Richter, 36 S. State St., Chicago, Ill.



**FOR SALE**—Steam Yacht, 66 ft. overall, 12 ft. beam, 3 ft. draught, 100 H.P. Roberts Water Tube Boiler, 90 H.P. Kemp Compound Condensing Engine. Speed 12 miles. Hull thoroughly rebuilt two years ago. Has always had excellent care and in first-class condition. Wm. T. Morris, Penn Yan, N. Y.



No. 3305—For Sale—46 ft. Fast Raised Deck Cruiser. Speed 15 to 16 miles; new 4 cyl. 6 x 6 Van Blerck motor. Saloon with two berths, large double stateroom. Interior finish mahogany. Constructed in best possible manner. Cox & Stevens, 15 William Street, New York.

Racine Runabout Motor Boat, 19 ft. long, 18 M.P.H., 16 H.P. Pierce-Budd engine; Special Cushions; Mohair Top; Full Equipment. Just overhauled and ready for water. Guaranteed. Correspond with S. J. Glunt, 631 5th St., Huntington, W. Va.

Launches, rowboats, big bargains, new samples and second-hand in all sizes. Several engines, all sizes. Send for list. Everett Hunter Boat Co., Dept. B, McHenry, Ill.

**FOR SALE**—Solid mahogany, copper riveted runabout, like new; length, 32 feet; beam, 5 feet; high speed 4 cylinder, 4 cycle 35-40 H.P. engine, Bosch ignition. Furnished in wicker, auto top, windshield, Warner Revolution indicator, electric lighting, etc. Exceptional bargain at \$900.00. F. J. Walker, Jr., 1482 Broadway, New York City.

Extraordinary values in dependable four cycle standard make auto engines, fine for power boats and ice sleds:

H.P. at 1000 rev.	H.P. at 600 rev.
H.P. Four cyl. auto engine.	H.P. One cyl. marine engine
12 Universal ..... \$55	1 Racine ..... \$22
15 Studebaker ..... 70	1 Pierce ..... 38
20 Ford and transmission 75	5 Graves ..... 55
22 Buick ..... 70	6 Terment-Monahan and gear ..... 70
25 Mitchell ..... 70	12 Barber ..... 85
25 Krit unit plant ..... 05	12 Rockford, 3 cyl. .... 80
30 Reo ..... 85	25 Barber, 3 cyl. .... 135
30 Regal ..... 75	Many others.
30 Cadillac ..... 95	
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## When Invention Runs Riot

(Continued from page 19)

and guard them. No U-boats could possibly approach because long before it could get within striking distance, the seaplane would see it and a depth bomb would settle it forever. I have the plan all worked out on paper and am sending, am coming, will send, to the President, Department, George Creel, at once, etc., etc., etc.

Far be it from the intention of the humble purveyor of near information who here holds forth, to cast ridicule, gentle or ribald, upon the sincere and well-meant efforts of anyone to help this country win the war. The most wild-eyed suggestions meet at least a smiling tolerance, even from the badgered officer who has to do with cranks. He knows they mean well, and most of them, to give them their due, are much more anxious to see Uncle Sam drinking beer in Berlin than they are to drink champagne at Uncle Sam's expense. Nevertheless, there is something to be said against the chap who wastes time and Washington's most plentiful commodity—Yclept red tape—in letters or telegrams or long distance phone messages like the above. If he would only ask himself a few questions first like this:—

"How will I anchor ships in the middle of the Atlantic?"

"How will I protect them against the U-boat at night, when the seaplane cannot see the shadow of the underside terror beneath the water?"

"How close must the transport travel to the mother ship?"

"If a quarter of a mile, how high must the seaplane fly to see a U-boat a quarter of a mile from a point directly beneath it?"

"If closer than a quarter of a mile, how will the transport manage to avoid a collision in bad weather?"

"What will 300 mother ships and 600 seaplanes and a thousand aviators and the necessary crews and mechanics cost to make and put in place?"

"How long will it take?"

"Wouldn't the money be spent to better advantage in supplying a couple of destroyers to convoy each merchantman?"

"All right," says B'jones K'smith, when these matters are mildly called to his attention. "All right, then do this. Have a couple of seaplanes accompany each transport and fly around and around and around it in circles, thus protecting it. That wouldn't cost so much or take so much time!"

Neither would it. But unfortunately a seaplane, air-boat, airplane or other aerial transport is not, as yet, in the automobile class. It doesn't just go and go and keep on going without attention. Supposing a transport requires ten days from port to port—that's 240 hours. The best that is asked of any engine for aerial duty is 100 hours of work without being taken down. Most planes after a hundred hours' work are ready for a very thorough overhauling. The vast majority of them come down many, many times in that hundred hours—fuel, water, oil, food for the man, rest for the man, etc., etc. Sometimes they have to come down when they don't want to. They would hardly land on the transport or does K'smith expect them to catch on to the smoke stack or masthead as they go by and hang on tight, a la comic movie? And while it is true that seaplanes can land in, and rise from water which is not too violently waving wet wild waves in the air, no one has as yet invented any very secure method of making the Atlantic or any other well-known ocean stay calm at all times and seasons. And we are entirely too tender-hearted to contemplate a disabled aviator coming down on the bosom of the sea and being left to his fate. If we were exponents of German frightfulness now—

However! B'jones and K'smith are by no means discouraged. One of the tribe had a fearful and wonderful suggestion to make recently, evidently fathered by one of these movie cartoons in which Uncle Sam, growing out of nothing with the magic of the swiftly moving artist's hand, suddenly launches a wedge-shaped formation of a few hundred thousand airplanes from America towards Europe, and, as the scene fades out to wild applause these "eyes of the army and navy" settle in a curious blotch on the screen marked Germany and pick it up and bring it home!

K'smith thinks this is a real idea. So he solemnly and sincerely proposes that the United States fly its 22,000 airplanes to Europe, starting them at five-minute intervals. He figures that in seventy-six days they would all land on the other side and that during that time sufficient transports could go and come perfectly protected to land 5,000,000 men in France.

He is perfectly well aware that the transatlantic flight has yet to be made. So he provides three landing stations—huge rafts in the Atlantic—at which the airplanes can stop and rest and get gasoline and oil and water and then go on again. Meanwhile, of course, the ships continue to plow by!

Now this sounds perfectly absurd. And so it is. But a lot of people think that this plan, or others like it, are perfectly feasible. They have absolutely no comprehension of the fact that the man-sized model doesn't work like the toy model—that flying one airplane or twenty of them anywhere is one thing and doing the same job by the thousand is a great deal more than a thousand times that job. But the military authorities know it, and of course this letter gets pigeonholed with the others.

When it comes to mechanical improvements in seaplanes and airboats, the grocery clerk, the ribbon counter-jumper and the waiter in the restaurant shine with a glory above that of Wright, Curtis, Edison, Gallaudet, and other similar experts. This, of course, is because nothing is easier than to invent an improvement to an airplane. In fact, it's so simple it's a wonder it doesn't occur to these discoverers that maybe someone has already tried to do it. But it never does, somehow.

Tony the Barber has read of the difficulties of the airplane man with the gun. He knows that some guns shoot through the crankshaft of the motor and that others are synchronized with the propeller, so the shooter won't shoot off his means of locomotion. He sees, plainly, that all guns which shoot in the general direction of an airplane's progress require that the shooter get constantly closer to the shooter, and thereby run Uncle Sam's daring birdmen closer and closer to danger. "Wherefore," thinks Tony the Barber, "I will put my wits to work and invent a gun which shoots sideways, so the airplane can run parallel to its enemy and demolish him at leisure." Tony has also heard or read or been told that an airplane can't carry all the ammunition it wants—only so much and no more. "Why not, then," argues Tony, "do away with heavy ammunition? What is simpler than to put rifle barrels on the propeller blades and feed bullets into them without powder, using centrifugal

(Continued on page 64)

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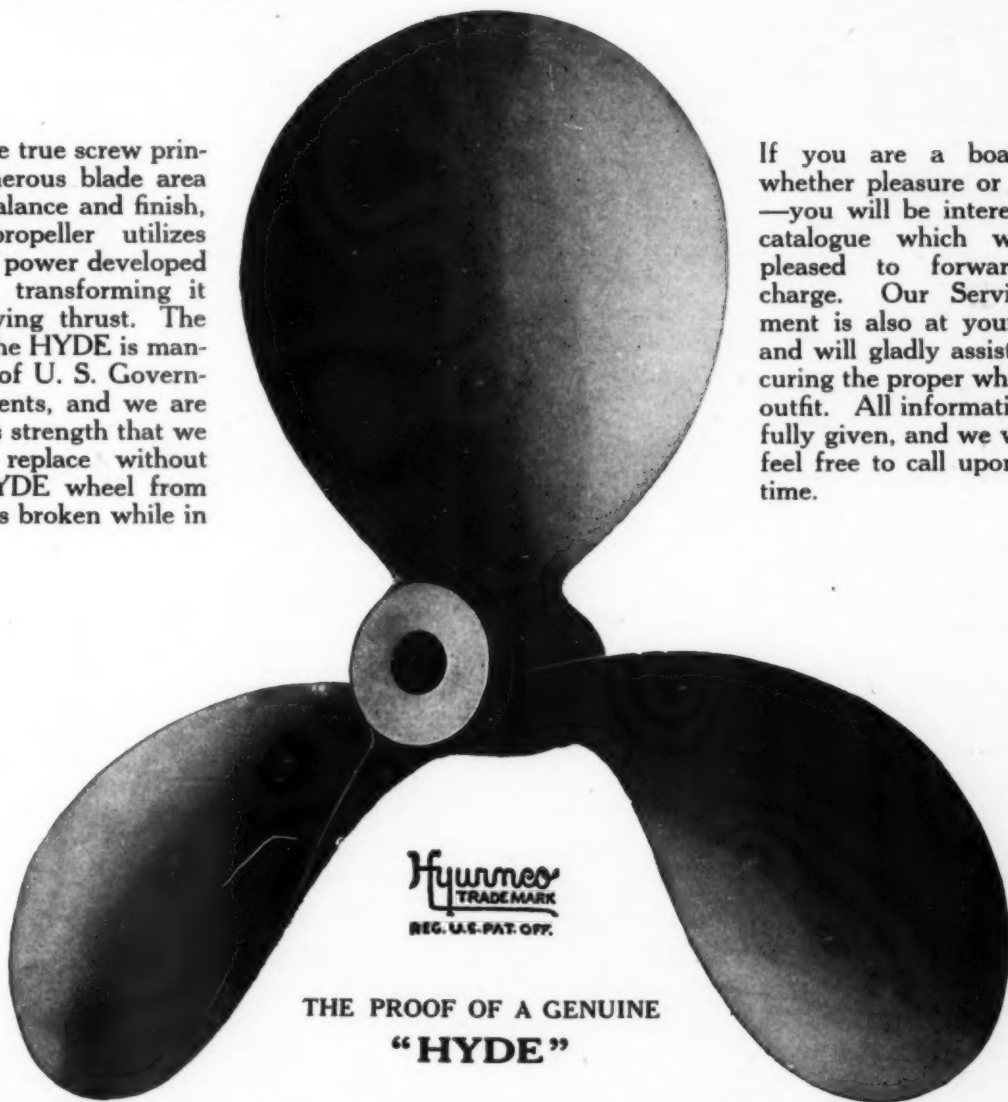
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# Practical Navigation for the Motor Boatman

(Continued from page 38)

sun were  $21.5^\circ$  N and the latitude  $20^\circ$  N the amplitude of the rising sun as found from the tables would be  $23^\circ$  N and the corresponding true bearing  $90^\circ - 23^\circ = 67^\circ$ , or on the old style compass N  $67^\circ$  E. A comparison of the true bearing of the sun and its observed bearing as taken with the sight vane or pelorus (see the first article of this series, November issue of MoToR BOATING) will give the compass error and the deviation.

The amplitude is simple when only the compass error is wanted, but because of the simplicity of the azimuth when worked in conjunction with the time sight for longitude it is more often used than the amplitude, especially where azimuth tables are available. When the azimuth and time sight are thus worked in conjunction the observed bearing of the sun should be taken by an assistant at the same time that the navigator takes the altitudes of the sun for the time sight, or should be taken by the navigator immediately after the time sight is taken. The azimuth tables will also help in getting accurate time sights for by looking in them the local apparent time at which the sun's azimuth will be  $90^\circ$  can be found, and this is, of course, the time at which the sun will be on the prime vertical.

The student should read the Bowditch chapters on the time sight and azimuth and read the explanation of the use of the azimuth tables printed with them. Next month the more modern methods of getting the line of position will be discussed.

## Problems Part V

(See March MoToR Boating)

Problem 1. On April 10, 1918, an altitude of the sun was measured with a sextant, the data being as follows:

Observed altitude of the sun's lower limb..... $42^\circ 31' 30''$   
Index correction of the sextant..... $+2' 30''$   
Height of the observer's eye.....28 feet.

Find the true altitude.

By the old-fashioned method of applying the corrections independently:

Obs. alt. @..... $42^\circ 31' 30''$   
I.C. ......... $+2' 30''$   
  
 $42^\circ 34' 00''$   
Semi-dia.  $15.99' = \dots +15' 59''$  (figures from the nautical almanac)  
  
 $42^\circ 49' 59''$   
Dip .....  $-5' 11''$  (from table 14 of Bowditch)  
  
 $42^\circ 44' 48''$   
Parallax and refrac. ....  $-56''$  (from table 20B of Bowditch)  
  
Altitude ..... $42^\circ 43' 52''$

By the modern method of table 46:

Obs. alt..... $42^\circ 31' 30''$  Tab. 46....  $+9' 47''$   
Total correction.  $+12' 17''$  Add. Corr.  $0''$  (from foot of page in table 46)  
  
Altitude ..... $42^\circ 43' 47''$  I.C. ....  $+2' 30''$   
  
Total Corr.  $+12' 17''$

Note that the two methods check each other to within  $5''$ , which is close enough for all purposes of nautical astronomy.

Problem 2. Find the Greenwich mean time at which the sun crosses the meridian of a vessel in longitude  $63^\circ 25' W$  on April 14, 1918, and find the sun's declination when on the meridian.

L.A.T. ......... $0^h 0^m 0^s$  (sun always crosses meridian at noon or at  $0^h 0^m 0^s$ )  
Longitude ..... $4^h 13^m 40^s$  ( $63^\circ 25' - 15^\circ = 4^h 13^m 40^s$ )

G.A.T. ......... $4^h 13^m 40^s$  (The long. was West so the G.A.T. was greater than the L.A.T. by an amount equal to the long.)

Equation of time..  $+24^s$  (the sign of the equation is reversed because it is to be applied to the G.A.T. instead of the G.M.T.)

G.M.T. ......... $4^h 14^m 04^s$

Declination at  $4^h 0^m 0^s$  on April 14 =  $9^\circ 16.4'$   
Correction ..... =  $+0.2'$

Declination ..... =  $9^\circ 16.6' = 9^\circ 16' 36''$  North

H.D. ......... =  $0.9'$

Interval since  $4^h = 14^m = .25$  hours

Correction ..... =  $.225'$

Note:—The correction to the declination at the even hour is the product of the hourly difference and the interval, the correction is added if the declinations increase as the day progresses and vice versa. The declination is Northern because it is marked in the Nautical Almanac.

Problem 3. On April 28, 1918, a vessel was in longitude  $49^\circ 18' W$  by dead reckoning. A series of observations of the sun were made at

noon the greatest altitude obtained being  $48^\circ 16' 00''$ , the sun bearing South. The index correction was  $-2' 00''$  and the height of eye 24 ft. Find the latitude.

Obs. alt..... $48^\circ 16' 00''$   
Correction .....  $+8' 25''$

Altitude ..... $48^\circ 24' 25''$

Tab. 46..... $+10' 29''$   
Add. corr.....  $-4''$

I.C. ......... $+10' 25''$   
..... $-2' 00''$

Correction .....  $+8' 25''$

L.A.T. ......... $0^h 0^m 0^s$   
Long. ......... $3^h 17^m 12^s$

G.A.T. ......... $3^h 17^m 12^s$

Note:—The difference between apparent time and mean time is so slight that it is sufficiently accurate to take out the declination for the G.A.T. instead of for the G.M.T. though this is incorrect in theory.

$90^\circ 00' 00''$

Alt. .... $48^\circ 24' 25''$  bearing S.

Z.D. .... $41^\circ 35' 35''$  North

Dec. .... $14^\circ 1' 24''$  North

Alt. .... $55^\circ 36' 59''$  North

Dec. at  $2^h$  April 28 =  $14^\circ 0.4'$

H.D. .........  $0.8'$

Interval .....  $1.3'$

Corr. .........  $1.04'$

Declination .....  $14^\circ 1.4'$

Position of the vessel latitude  $55^\circ 36' 59''$  North, say  $55^\circ 37' N$ . Longitude  $49^\circ 18' W$ .

Problem 4. The predicted noon position of a vessel is latitude  $0^\circ 46' N$ , longitude  $63^\circ 51' E$ . A meridian altitude of the sun is to be taken, the date being April 21, 1918, the error of the chronometer  $8^m 12^s$  fast, and the navigator's watch being  $4^h 12^m 10^s$  fast of the chronometer. Find the proper time by the watch to take a meridian altitude.

When the sight was taken the data was as follows: Obs alt. @  $78^\circ 51' 30''$  bearing South, index correction  $+2' 30''$ , height of eye 10 ft, find the latitude.

Part one: L.A.T.... $24^h 0^m 0^s$  April 20. (This is the time at which the sun will cross the meridian.

Long. ...  $4 15 24$

G.A.T. .. $19^h 44^m 36^s$

Equation of time at  $18^h = 1^m 8.5^s$

H.D. .........  $0.5$

Interval .....  $1.7$

Corr. .........  $.85$

Equation of time.....  $1^m 9.4^s$

G.A.T. ......... $19^h 44^m 36^s$

Equation time.....  $1 9$

G.M.T. ......... $19^h 43^m 27^s$

Chronometer corr.....  $8 12$

$19^h 51^m 39^s$

$12 00 00$

Chronometer time at

which sun crosses

the meridian.....

Difference between

chronometer and

watch .....  $4 12 10$

Watch time..... $12^h 03^m 49^s$

Obs. alt. @..... $78^\circ 51' 30''$

Corr. .........  $+15' 12''$

Alt. ......... $79^\circ 06' 42'' N$ .

$90^\circ 00' 00''$

Alt. ......... $79^\circ 06' 42'' N$ .

Zenith Dist..... $10^\circ 53' 18'' S$ .

Declination ..... $11^\circ 36' 54'' N$ .

Zenith Dist..... $10^\circ 53' 18'' S$ .

Latitude .....  $0^\circ 42' 36'' N$ .

Dec. at  $18^h$  April 20 =  $11^\circ 35.4'$

H.D. .........  $0.9$

Interval .....  $1.7$  hours

Corr. .........  $+1.5$

Declination .....  $11^\circ 36.9' N$ .

## Problems Part VI

Problem 1. August 1st, 1918, p. m. position by dead reckoning is Lat.  $36^\circ 51' N$  Long.  $41^\circ 38' W$ . Obs. alt. @  $25^\circ 26' 00''$ , time by watch  $4^h 10^m 12^s$  index correction of the sextant  $+20''$ , height of eye 38 ft.

(Continued on page 82)

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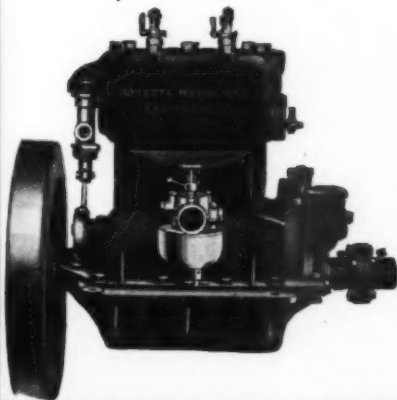
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## The Need for Commercial Motor Boats

(Continued from page 26)

stowed in the tank, the turntable is swung around so that the roller is parallel to the starboard sheer of the boat, and the husky fishermen haul the empty net overside and pile it neatly ready for another cast.

No single type of motor fishing boat anywhere in the world has proved out its every detail of design and equipment more certainly than the motor purse seiner of the north Pacific Coast. I have watched them work under every possible condition, and I have never yet seen them fail to "bring home the bacon."

There are, at this time, between seven and eight hundred of these purse seiners in service in Puget Sound and Alaskan waters, with a few working off the Oregon Coast during the season. Spring, summer and fall are their busy periods, as different species of salmon wend their way into the bays and inlets seeking out the stream in which they will spawn.

Next in importance in combating the waters for salmon are the little gill netting motor boats, of which several thousand are now in service. These are almost universally of the Columbia River type of hull, or a modification of it, and they swarm by the thousands on the Columbia River, Puget Sound, British Columbia and Alaskan waters. This Columbia River hull is very beamy, very flat of bottom, and has very hollow sections fore and aft. It was developed through long years of the hardest kind of usage on the lower Columbia River, and its seaworthiness has been well proved out on the boiling waters of the Columbia bar. The hulls usually run from 26 to 30 feet in length, with beam of 5 to 6 feet. They drive easily and carry a heavy cargo of fish, even in rough weather, with perfect safety. They are usually driven by single-cylinder motors of 5 to 7 h.p., of the San Francisco heavy-duty type. Eastern engine manufacturers, who have developed a single-cylinder, heavy-type of engine for this service, have of late years sold many motors to these fishermen, but it was only after designing a motor to fit their needs. No eastern type of motor other than these has ever made any headway with these gill netting fishermen.

Their fishing is practically all done at night, for it is necessary that the fish shall not see the meshes of their drifting nets if they are to become entangled and captured. The nets, usually about 300 fathoms long and 35 to 50 feet deep, are payed out across the tide or river current and the fishermen then drift with their nets for several hours before hauling in.

On the Columbia River nets are often set out during the night and left, the fishermen returning in the morning to make their haul. Because the fishermen spend less time in their craft, and because the nights are warmer on the Columbia, few of these motor craft have houses on them. In the Puget Sound and Alaska districts, however, gill netting is fitted with a trunk cabin, and usually a stove is installed for warmth on the long night watches.

In British Columbia waters the fishing in this type of boat is practically all done by Japanese, and on their craft will be found many little touches that stamp them indelibly with their Japanese origin. Several thousand Japanese are now fishing for the British Columbia canneries.

The largest motor craft used in the salmon fisheries is the so-called cannery tender. And although this boat does no actual fishing, it is a mighty important cog in the salmon gathering machine and has been developed to a highly efficient stage.

The cannery tender is in reality a husky motor tug boat, with huge fish holds fore and aft, equipped with heavy fittings for lashing scows alongside. Before the fishing season opens the cannery tenders are used in towing piles and pile drivers to the various trap sites, taking supplies to the canneries and trap tenders and in a hundred different ways assisting in getting everything in readiness for the coming of the salmon.

And when the big run starts, and the fish begin to clog the traps, the cannery tender works a twenty-four hours a day, towing scow-loads of salmon to the canneries and empty scows around to the various traps. It is a sight to make a motor boatman proud to see one of these powerful motor cannery tenders, with a huge scow load of fish lashed on either side and her own decks almost awash with the load of salmon she is carrying in her fish holds, boiling off to the cannery as though it were the easiest thing in the world. Anyone who knows motors knows that this tests the fabric of the engine to the utmost, and the fact that practically all this sort of work is now done by motor-propelled craft is good proof of the dependability of the modern heavy-duty gas engine. A breakdown of a cannery tender means big losses, for fish don't keep; and breakdowns are of mighty rare occurrence.

A typical cannery tender of the type that has been developed during the last ten years is the "Lummi," designed by Messrs. Lee & Brinton, of Seattle, for the Lummi Bay Packing Co. The "Lummi" is 88 feet 4 inches in length, with a beam of 17 feet 8 inches, and is powered with an Imperial engine of 125 h.p. This motor drives her at a speed of nearly ten knots.

The "Lummi" is fitted with fish holds fore and aft, and these, with the deck space also available, will accommodate 150,000 pounds of salmon.

Like all the cannery tenders, the "Lummi" has accommodations not only for her crew, but for several more, as it often falls to the lot of the tender to act as "home" to a trap crew during work preliminary to the season. These quarters are forward, under the raised deck. The captain's quarters are in the texas aft of the wheel-house.

The engine is installed in a good sized engine compartment beneath the wheel-house.

Hoisting gear, for handling the trap trailers, etc., is installed just forward of the wheel-house on the main deck, and the winch is run by gearing from the forward end of the main motor below.

On some of the larger cannery tenders hoisting gear is more elaborately arranged, to care for the anchor cables, salmon handling, etc. While this hoisting machinery is usually run by gearing it to the main motor, often a small auxiliary motor is installed to care for it.

The largest motor cannery tender thus far built, other than that of the heavy-oil-engine type, is "Superior," owned by Lee H. Wakefield. "Superior" is fitted out like a yacht in many respects and, with her 200 h.p. Atlas motor, is one of the most powerful craft of her type on the coast. She is 85 feet long with a beam of 18 feet.

The fleet of motor cannery tenders now in service in the Pacific northwest and Alaskan waters is a fleet of wonderfully staunch, serviceable motor craft, and the records for consistent, day-in and day-out service these boats have made is a tribute to the present-day dependability of the marine motor.

(Continued on page 62)

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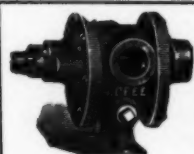
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## The Need for Commercial Motor Boats

(Continued from page 60)

There is now in process of evolution in the salmon fisheries a type of trolling boat, but no definite type has yet made its appearance from among the many craft engaged in this work. The motor troller needs plenty of deck room aft, easy control of his craft while fishing, a tank to take care of the fish after catching, and accommodations for at least two persons. It must also be a mighty good rough weather boat. Very probably a distinct type will eventually grow out of the variety now in use, as in the case of other craft used in salmon fishing, and it will be interesting to see what this type will be.

Lovers of the sea will find their greatest interest in the Pacific Coast fishing fleet centering on the motor halibut schooners that every year gather in millions of pounds of that toothsome fish from the floor of the north Pacific Ocean. For these schooners are real ships, and the weather doesn't blow that they can't break if it comes to the pinch.

Motor schooners for this work began to appear in the first ten years of the present century, but it was not until about 1910 that building of these craft was really taken up in earnest. They are a mighty different boat from the famous Gloucester fishermen of the eastern banks, for the latter have always depended on the wind to bring them home, and the result is that they are long and lean and carry an immense spread of canvas on their tall, tapering spars.

The Pacific Coast halibut fishermen, on the contrary, cannot depend on the wind, for the winds he encounters are fluky and erratic, and much of the journey to and from the fishing banks must be made on protected waters, where light winds and heavy tides would play havoc with speed if sails alone were depended on. So he has installed a big San Francisco heavy-duty motor away astern in his schooner and, wind or no wind, he plugs along at from eight to nine knots hour after hour.

Because he uses a motor his sails are auxiliary power, and usually only of the heaviest working rig. His spars are neither tall nor graceful, and no topmasts tip their peak. A foresail and jibs are the usual rig that is spread to the wind when there is wind to help him along, and when he is riding to anchor out on the banks a big triangular riding sail is usually spread from the mainmast aft.

A typical halibut schooner of the best type is the "Tyee," built on Puget Sound in 1914, from designs by Messrs. Lee & Brinton, of Seattle. The "Tyee" is 103 feet long, with a beam of 20 feet 10 inches, and makes a good nine knots with her 140 h.p. San Francisco Standard engine. In construction the "Tyee" is as staunch as her sister ships of this halibut fleet, and that means she is built to ride on any sea and blow. She has a fir keel and keelson of liberal dimensions, and her stem and sternpost are of solid white oak, selected from seasoned timber without a flaw. Her frames are of sawn oak, 5 inches square and doubled, with 12-inch space between frames. The planking is 3-inch fir.

The crew's quarters are forward, in a spacious fo'castle, but owing to her liberal size the stowage of the "Tyee" is located aft, unlike most of the fleet, whose crew's quarters are entirely forward.

Eight dories are carried by the "Tyee," four nested on either quarter, with stout derrick booms footed in the mainmast to swing them overside when the fishermen put off to fish.

Fish tanks carrying 200,000 pounds of iced halibut occupy the entire amidship section of the boat.

On all these big motor fishermen ground tackle and methods of handling it are interesting to the technical minded, and on the "Tyee" this is especially true.

Her windlass forward carries 350 fathoms of 1 1/4 inch steel mooring cable, to which is also attached several shots of heavy chain. This is necessary when the fisherman stays on the banks even through heavy blows, a condition met with often during the season. This heavy cable is handled by means of power transmitted to the windless drum from the main engine below, a messenger chain, acting as a sprocket belt, driving the windlass from chain sprocket wheels just forward of the wheel-house. Practically all the halibut schooners handle their ground tackle with power from the main power plant.

The fleet now numbers about 100 vessels, and, while most of the fish were formerly landed at Seattle, many now land their catches at Prince Rupert, where the fish are loaded on refrigerator cars to be sent eastward over the Grand Trunk Pacific Railroad. Most of the outfitting of these vessels is still done at Seattle, however, as in the past.

Upwards of 50,000,000 pounds of halibut are shipped to eastern markets every year, and most of this is caught by the motor fishermen. They are a hardy set of sailors, as are deep sea fishermen, on any coast, and their life is one of hardship once they arrive at the banks. For a time halibut prices were jockeyed so low by certain interests that it began to look as if the motor schooners would have to go out of business, but the last year has seen good prices and good profits for the fishermen and the future seems assured.

All the crews fish on shares, as they do on the salmon boats, and this makes for better satisfaction all around.

From the northwest coast to San Francisco there is no special type of motor fishing craft in use, but on San Francisco Bay and its tributaries will be found a small motor boat of a type seen nowhere else on the coast. This boat, from 25 to 35 feet in length, is decked over from stem to stern, save where there is a small cockpit for the fisherman to stand while navigating his boat. The engine, usually a single-cylinder heavy-duty motor, is installed under a hatch amidships, and the fisherman stands just aft of it in his small compartment.

Many of these boats are built with the clipper stem, the idea evidently being brought over from the old world by the Italian fishermen, who man most of the little craft.

They fish the waters of the bay and its tributaries for crabs and the smaller species of fish with which those waters abound, and most of the fleet moors in an enclosed basin built for them down at "Fisherman's wharf."

Los Angeles harbor, which, by the way, is twenty miles from Los Angeles city, is the headquarters for the constantly growing fleet of motor boats engaged in tuna fishing. The tuna, weighing from 20 to 40 pounds, is canned in large numbers in many canneries located at this point and at San Diego. The fish are caught by trolling, and the type of boat engaged in this work is a good example of the survival of the fittest in every detail of its design and arrangement.

A typical tuna boat is the "Fujiisan," owned, like many the others, by a Japanese fisherman. She is 41 feet long, 11 feet of beam and has a 35 h.p.

(Continued on page 64)

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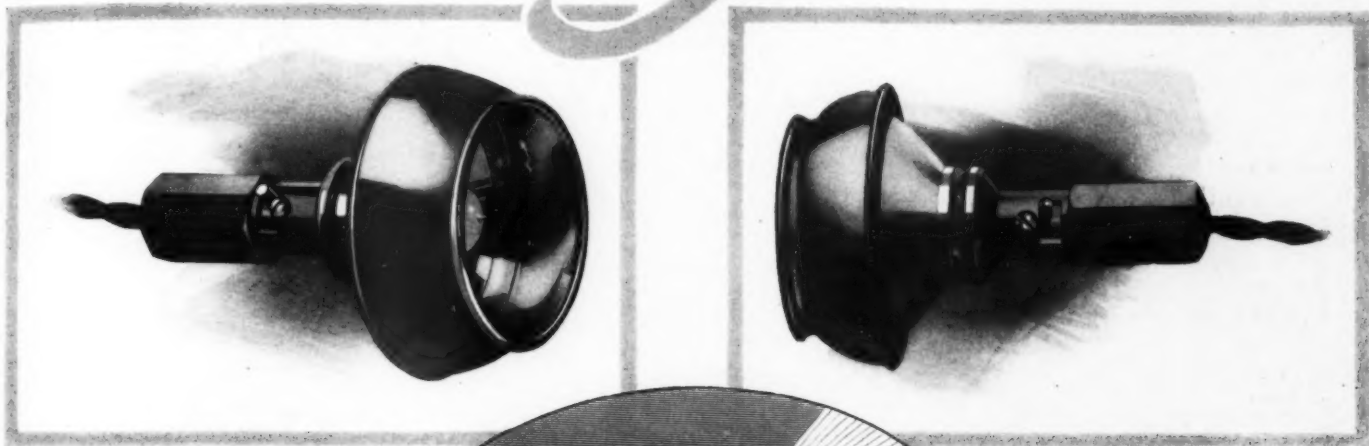
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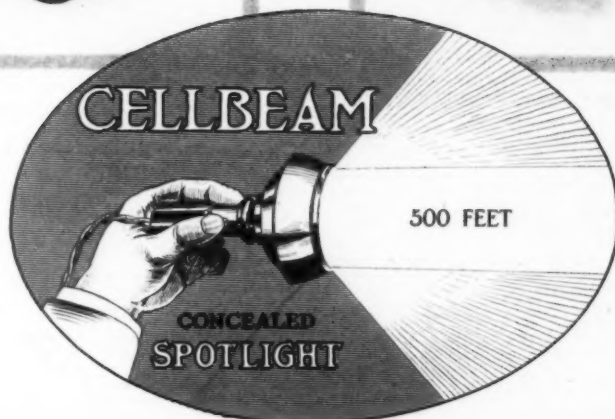
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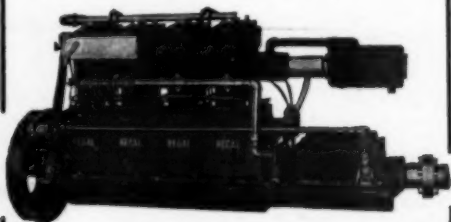
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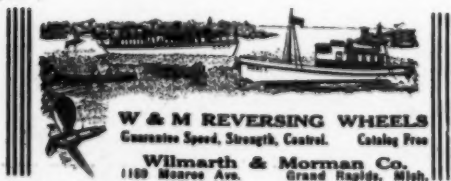
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## When Invention Runs Riot

(Continued from page 56)

force to eject the bullets? A simple calculation as to the point of revolution in which the bullet is inserted in the barrel provides that it be jerked out on the horizontal plane and everyone knows that it isn't necessary to have great penetrating power for a bullet used in the air—knocking the enemy airman senseless will kill him eventually as well as shooting him full of holes!"

Behold a full set of drawings, fearful and wonderful to behold, and Tony the Barber tells all his customers that he has really won the war.

And so this story might run on for pages and pages, for the readers' patience would evaporate long before the archives of the Government would run out of new ways to put an aerial spoke in Kaiser Bill's world dominion wheel. Perhaps, however, enough has been written (please don't anyone say too much, for this is the present offender's first break into these columns and he wants to come back!) to indicate to a tolerant public that just because an idea looks good on paper, it isn't necessarily practical and workable to the man whose job it is to apply such ideas.

Aeronautics is a dainty, difficult and abstruse science. It combines a rapidly developing practice with many an hypothesis, none of which can safely as yet be called proved theories. The fact of to-day is the mistake of to-morrow, and so rapidly are improvements and changes being effected that the best battle plane of to-day will be a curiosity three months hence.

With the art in such a state of flux and with the artificial but highly cultivating draft with which the war is forcing this particular scientific plant, it is unwise to stamp as absurd any serious attempt to change the existing order. But such attempts are serious, only when they come from brains trained in the knowledge of to-day—seldom if ever to be regarded as really worthy of attention when they come from the man, no matter how earnest and well meaning, whose knowledge of aircraft is limited to seeing Captain Blaw-blah do a "loop the loop" and a "falling leaf," some brown pictures in the Sunday supplement, and the reading of a few war stories dealing with the fight in the air.

And that, in the last analysis, is why all these ways to "win the war" get buried in official files, never again to see the light of day, unless, perhaps, a thousand years from now the absurdity of 1918 becomes the fact of 2018, even as to-day our aerial facts are the things for which dreamers were burned as magicians a thousand years ago.

## Why Does an Airplane Fly?

(Continued from page 12)

If you lay an oar blade on the surface of the water, the other end of the oar in an oarlock the oar tip will sink and to a depth required by the displacement law. If you start the boat moving forward, however, and incline the oar upward, it will come up and skim over the surface, as when one feathers in rowing, supported by its impact against the inertia of the water. This is the principal of the hydroplane. At rest it floats in the water by displacement. Once started with plenty of power behind it it starts to rise out of the water by the impact of its "plane" against the water under it.

At last it skims along on the very surface, supported entirely by its "wing reaction" against the water under it. Such boats make speeds well over sixty, but are bad in rough weather—for remember still that this is operating on a surface. For a real analogy to the airplane we must get back to our submarine again. For the airplane more nearly resembles an airplane, than a hydroplane, though it is the reaction against planes that keep both U-boat and airplane suspended where one will in water or air.

When the U-boat "lands" it comes to the surface of its sustaining medium. When the airplane lands it drops to the bottom of its air sea.

Water weighs about 62 pounds a cubic foot, so that small wings will lift a 1,000 pounder in water with quite easily. Air weighs about .076 pounds per cubic foot, so to lift the same weight at the same speed the airplane would have to have 800 times the surface. This is obviously impossible.

The airplane however does not travel slow like the undersea boat, and need not weigh a hundredth as much, so there are considerations in air work that do not make flying possible.

In the submarine we try to make the structure weigh the same as its displacement in water by adding weight in tanks. In the airplane we try to equalize by making the structure as light as possible, even at that we cannot make it light enough to float. It cannot get reaction enough on the air under its wings to lift it at boat speeds, but if we double the speed, say 24 miles an hour instead of the 12 of the U-boat, we get four times the inertia out of the air, equal to an air weight of .3 pounds a cubic foot. Then if we double again and go up to 48 miles an hour we get 1.2 pounds, and so on, so that when we get speed enough our pressure under the wings finally equals the weight of our aircraft and we soar off the ground into space.

So much for why airplanes get off the ground. A later article will tell how it is done.

## The Need for Commercial Motor Boats

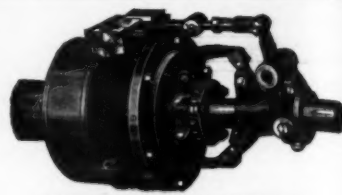
(Continued from page 62)

Atlas motor in her engine-room. "Fuison" has a pilot house, with trunk cabin forward covering the engine-room and crew's quarters below. On the after deck is a bait tank, for live sardines are used for bait and they must be kept in a tank of fresh water from the time they are caught till they are used. A centrifugal pump, driven by friction from the engine flywheel, keeps fresh salt water circulating in the tank.

The bulwarks are built up well along the sides, so that, as fast as the fish are landed, they may be dumped on the deck. Tuna being considerably after being caught, so the decks of these tuna fishermen are all painted red, so that the blood will show as little as possible.

Several hundred of these craft are now plying out of Los Angeles Harbor and from San Diego, too, and they work as far south as Lower California and as far north as Santa Barbara Channel. A large percentage of the fishermen are Japanese, though Italian and Russian fishermen also own many boats.

The industry has grown to large proportions in the last five years, and has opened a field for boat builders and engine manufacturers on the south coast much greater than ever existed there before.



MANUFACTURED IN SIZES TO MEET ALL REQUIREMENTS  
Also One Way Clutches

NAVY GEAR COMPANY  
JOE PETRELLI, General Manager  
NEW HAVEN CONN.



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is what you get in Watkins Class Ball Iron Motors. Especially fine for canoes and light boats. Constant and efficient.

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12 H. P. four cylinder .... 160 lbs.

Are light, at the same time strong; accomplished by using semi-steel castings, high carbon steel shaft, bronze bearings, high class workmanship.

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### Buy a Campbell and Keep Going

Sizes 5 to 60 H. P.

The Engine of Accessibility

THE WATER CRAFT CO.  
221 Fulton Street  
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General Distributors



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An improved 3500 Double Cabin Cruiser ready for delivery.

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## STANDARD OIL ENGINE

The Seagoing Engine

SEMI-DIESEL

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25, 38, 50, 75, 100, 150 H. P.

We also make 4, 8 and 12 H. P. 2 Cycle

Stationary Engines.

STANDARD OIL ENGINE CO., Inc.  
Main Office and Works, BRIDGEPORT, CONN.

## POLARINE

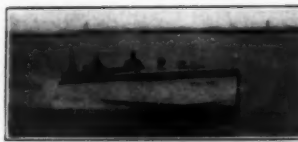
The Standard Oil For All Motors  
Standard Oil Co. of New York

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Consideration

Our 25' special, a V bottom runabout of 5/8" beam is meeting the demand for a good, strong, comfortable boat for the low and medium rather than high powered motors. This makes a strictly high class outfit at a moderate price and running expense low.

Other runabouts from 18' to 36'.

Our cruisers are built to order to meet individual requirements. They embody the best of modern features in either high speed express or more comfortable types. Anything in the boat line from K. D. to complete outfits.

RICHARDSON BOAT CO., North Tonawanda, N. Y.



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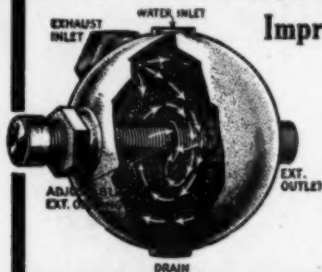


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THE LUNKENHEIMER CO.  
CINCINNATI

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Advertising Index will be found on page 102

# Silence!

The law compels you to have an effective silencer on your boat. Many boat owners think they are beating the law by conducting the exhaust under water or some other complicated method, but it is a fact that they lose more in power and wasted fuel due to the back pressure than the cost of an



## Improved Thermex Silencer

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Complete

Effect great economy in use. Positive control—no back lash Installed in DISTURBER IV



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Est. 1847



"Bites  
Quick"

Holds  
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Mfrs. of the Famous Maxim Motor Boat Silencers.

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Please bear with us until

## AFTER THE WAR IS WON

Hundreds of installations—they aggregate over a million and a quarter h.p.—couple engine or reverse gear shafts to propeller shafts, also on heavy duty power machinery. Each installation, free from misalignment troubles, is the best reason you should use

## FRANCKE FLEXIBLE COUPLINGS

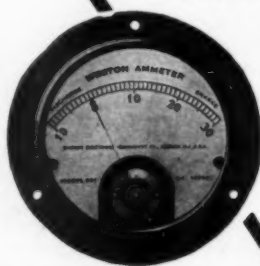
The result of satisfactory service—even with increased facilities, our factory is swamped with coupling orders, the kind to which we are privileged to give priority. Get acquainted now—Literature on request—Deliveries later.

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Model 301 Ammeter

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The Light that never fails!  
**HENRICKS**  
EUREKA

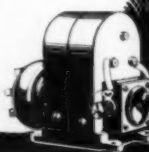
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These Outfits must do all that we say they will and be all that the name Henricks stands for: Quality, Service, Economy.

Get our booklet; there's a Henricks outfit made for your boat.

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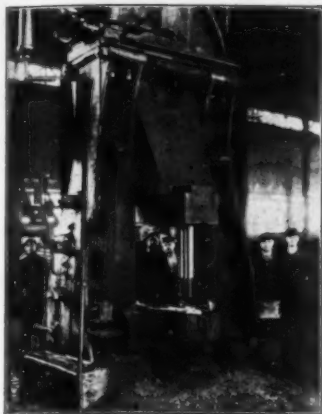


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Easier Starting. Most eco-  
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Marine Water-Tube Boilers  
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Will quote on propelling machin-  
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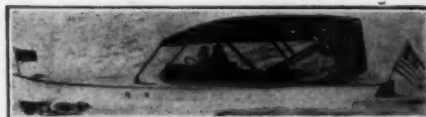
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Let us build one of these tops  
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**Auto Boat Tops • Spray Hoods • Cushions**  
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Let us give you an estimate. Write for catalog and measurement  
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A "Safety-First" Tank for Motor Boats and Yachts

"Never-Leak" Tanks are made of one length of suitable gauge sheet steel,  
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MOTOR BOATS	
16, 18, 20 and 24 ft.	
Without engine	\$70 and up
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If you have an engine we will be  
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DETACHABLE MOTOR BOATS	
Standard Model	\$40
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CATALOG FREE—PRICES BASED ON SELLING DIRECT TO USER—ORDER BY MAIL.  
Please state what kind of boat you are interested in, we can meet your requirements in PRICE,  
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## HIGH SPEED SEA SLEDS AND SURFACE PROPELLER CRUISERS

The only boats capable of high speed in rough water, in shoal water, or in heavy weed growths

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Now giving supreme satisfaction in more than 25,000 motor boats, large and small. A strong, quiet, clean, trouble-proof gear that takes little space and lasts as long as the boat itself.

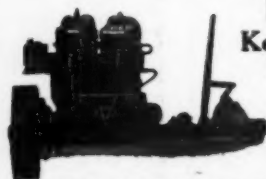
Our new factory has increased our production facilities by 400%.

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**REVERSE GEARS**  
4 Sizes  
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per 150  
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NO GASOLINE, NO DANGER, Maximum Power, Lightest Weight, Simple, Reliable, Economical. No batteries, Self Ignition by Compression. Fully guaranteed. Write for catalogue M. Crude, Fuel or Kerosene Oil.

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With this Electric Searchlight you can see to go anywhere at night. Make every night a boating pleasure. Don't wait for the moon. Increase the usefulness of your motor boat with a

### DELTA Electric Searchlight

Throws a beam of light 1000 feet and in any direction. Pick out your course ahead, study the shore or find the landing with ease on the darkest nights. Just as valuable to you as the Searchlight is to the U. S. Navy where many *Deltas* are in use. The Delta Searchlight uses storage batteries but can be converted for use with dry cells.

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Made in 28"—36"—  
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OR YOUR JOBBER

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You can't expect to get the full quota of power, service and durability out of your engine unless you supply it with a lubricating system which cannot fail under any condition. Remember that a marine engine operates under full load all the time, and that even a momentary failure of lubrication means metal to metal contact of wearing parts which will result in scored cylinders and burned out bearings.

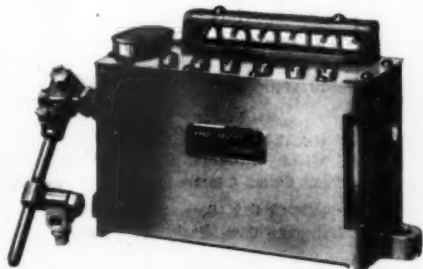
### MANZEL FORCE FEED OILERS

pump the oil under pressure to each wearing point individually. Nothing is left to chance. As long as you can see oil in the sight glass you know that each part is being properly supplied.

Manzel Oilers not only make complete failure of lubrication impossible but by their uniform measured operation they use the minimum of oil and reduce engine wear to the lowest possible degree.

Made in a complete variety of sizes and styles, from one to fifty feeds. Rotary or Ratchet Drive.

Write today for copy of our free booklet on lubrication.



**MANZEL BROTHERS COMPANY**  
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## R. M. Hvid Company

LICENSER OF THE HVID OIL ENGINES

First National Bank Building, :: Chicago, Ill.

We solicit correspondence regarding license to manufacture engines under patents owned by us.

"HVID ENGINES RUN ON ANY OIL WHICH FLOWS FREELY"

Highest fuel economy. Extreme simplicity.

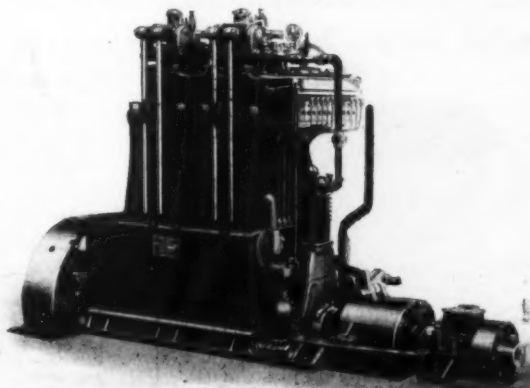
Absolute reliability in operation.

No preheating or starting on gasoline at any time.

No ignition devices of any kind. No carburetors.

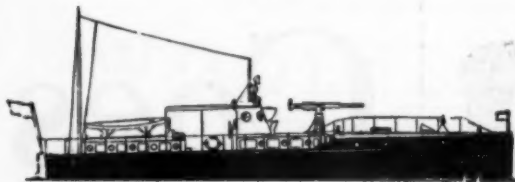
The simplest and most reliable engine built.

Thousands in use now in sizes from 1½ B.H.P. to 100 B.H.P. per cyl.



View showing a 2-cylinder, 20 B.H.P. Hvid Oil Engine as built by the Burnell Engine Company, South Bend, Ind.

R. M. Hvid Co., First Nat'l Bank Bldg., Chicago, Ill.



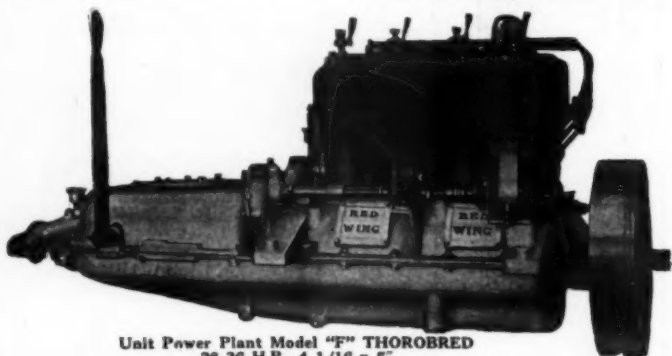
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STAMFORD, CONN.

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THE MOTOR WITH POWER TO SPARE



Unit Power Plant Model "F" THOROBRED  
28-36 H.P., 4 1/16 x 5"  
Furnished with or without Unit Power Plant

### Hitch Your Cart to a Star

If you were going to raise chickens, you wouldn't fill your coops with haphazard barnyard cluckers and trust to luck.

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Wise selection means everything—pleasure, profit, economy, satisfaction.

Get a tried and proven aristocrat—a "Thorobred", with a pedigree behind it. Red Wing Thorobreds are blue ribbon winners. They are an investment. Owners know. Look up a Thorobred owner.

Write us today regarding your requirements. Get the full facts on our four models, 14 to 40 H.P. 4 cyl. 4 cyc., for speed or work. Kerosene or gasoline.

### RED WING MOTOR CO.

Dept. B, RED WING, MINN., U. S. A.

## 20th CENTURY Gasoline Motors

2-Cylinder—6 1/2" x 8 1/2"—15-20 H.P.—400 R.P.M.  
4-Cylinder—6 1/2" x 8 1/2"—40-50 H.P.—400 R.P.M.  
6-Cylinder—6 1/2" x 8 1/2"—65-75 H.P.—400 R.P.M.

Strictly high grade four-cycle engines, built for heavy duty service.



NEW YORK YACHT, LAUNCH & ENGINE CO.



65 ft. x 14 ft.—JINETTA—J. H. Becker

Most yachtsmen know of the satisfaction given by yachts designed, built and powered by us; our experience is at your command. plans on file of all size yachts.

Send Us Your Inquiries

:: Morris Heights, New York City

### IMPROVED MOTOR BOAT CLOSET

Figure 1404



Dimensions: 18 x 18 x 11" high to top of bowl; 2 1/4" cylinder. For above or below water line.

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Price .....\$25.00

THE J. H. CURTISS CO.

### The J. H. Curtiss Co.

Pioneer Specialists in Marine Sanitary Fixtures

Since our advertisement appeared in the first issue of Motor Boating, December, 1907, hundreds of Curtiss fixtures have been installed in motor cruisers and yachts of all sizes, including some of the finest boats launched within this period.

The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

### With Pump

Lining and Fixtures Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

No. 5

Height, 19 inches.  
Width, 19 inches.

Depth Closed, 6 inches.

Quartered Oak Case, Each...\$42.50  
Mahogany Case, Each..... 44.00

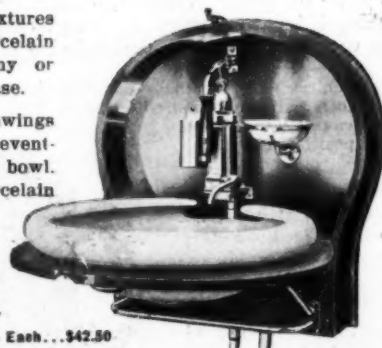


Fig. 1392

2 South Street, New York

## Comfort—Convenience and Ease of Control!



The things you will look for first—comfort—convenience—ease of control—beauty in design—and above all, seaworthiness—mark

### RacineWis Runabouts Everywhere

The utmost in Service—that's why RacineWis boats have been chosen by U. S. and Foreign Gov'ts, mercantile firms and prominent yachtmen the world over

Runabout, Speed Boat, Cruiser, Freighter, Rowboat or Canoe—there is a RacineWis model to fit your needs—or we will design and build one especially for you.

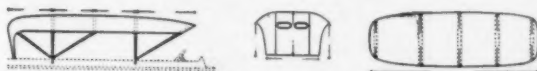
Tell us the type of boat in which you are interested and we will mail you our special catalogue immediately.

**RACINE BOAT COMPANY**  
1615 Racine Street, RACINE, WISCONSIN



## Save $\frac{1}{2}$ to $\frac{2}{3}$ By Doing Your Own Top Re-Covering

If your boat top frame is in good condition, we can save you half the cost of a new top with our proven system enabling you to re-cover your own top.



### "Casco" System Measuring Charts

Makes it very simple for you to cover any boat top, insuring a perfect, tailored fit. We absolutely guarantee your satisfaction.

Our catalogue contains the charts—also complete line of sample fabrics; the best and most durable special top materials made. Request a copy and investigate this satisfactory system for saving expense.

**The Cincinnati Auto Specialty Co.**  
Boat Dept. 4th and Elm Sts. Cincinnati, Ohio

## Your Motor- LUNKENHEIMER Equipped



is synonymous for efficiency and reliability in service.

Lunkenheimer Motor Accessories have demonstrated their worth on all classes of internal combustion engines.

Being practical and durable they efficiently perform the functions for which they are intended and contribute materially to the successful operation of your craft.

Specify Lunkenheimer and insist on having the genuine. Leading dealers everywhere sell them.

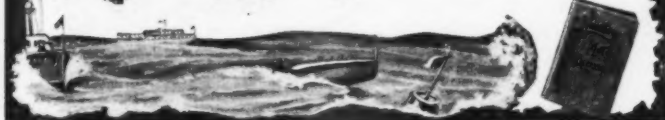
Write for Motor Accessories Catalog No. 4-CC which illustrates the complete line.

**THE LUNKENHEIMER CO.**  
"QUALITY"

Largest Manufacturers of  
High Grade Engineering Specialties in the World  
CINCINNATI  
New York Chicago Boston London



29-19-33



### MORE FLEXIBILITY

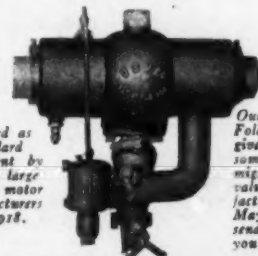
Continual use for the past year has proved the added flexibility possible with the Olsen. Whether your motor is running idle or with a load, there is always an even constant flow of power, impossible with any other burner.

**Full Cost Re-  
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Days on  
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One has a clean, smooth, slippery bottom and is driven at a high rate of speed with the least possible power. The other is heavily penalized with marine growth and a foul bottom—which often costs 50% of its efficiency.

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**THE Koban** gives you greater speed because it has more power. Its two cylinders enable it to deliver maximum power from every gallon of gasoline.

The **Koban** is the motor for those who demand real service, efficiency and simplicity.

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## Caille Marine Engines Inboard Outboard



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THE CAILLE PERFECTION MOTOR CO.  
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Dimensions of boat—it is very important to give these:

Length.....ft. Beam.....ft. Draught.....ft.  
 Purpose used for: ☐ Work. ☐ Pleasure.

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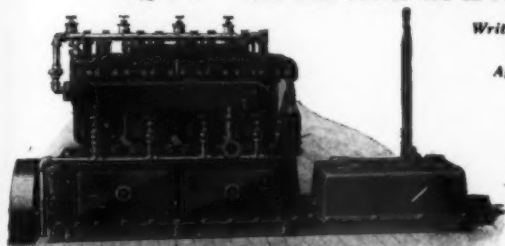
## K E R O S E N E

The ultimate solution of the fuel problem. Saves *more than half* of fuel expense, without sacrificing flexibility, power or reliability.

The Wright Kerosene Engine is thoroughly perfected. The kerosene is perfectly *gasified* before it enters the cylinders. It burns clean, free from carbon or lubricating troubles. No smoke or odor in exhaust.

Valves in cylinder heads. Make and break ignition. Bosch Low Tension Magneto

3-Cyl. ....	6	x 7 1/2"	22-30 H. P.
3-Cyl. ....	7 1/2	x 9 "	35-45 H. P.
4-Cyl. ....	6	x 7 1/2"	30-40 H. P.
4-Cyl. ....	7 1/2	x 9 "	45-60 H. P.
6-Cyl. ....	6	x 7 1/2"	45-65 H. P.
6-Cyl. ....	7 1/2	x 9 "	70-90 H. P.
6	x 7 1/2"	runs from	400 to 550 R. P. M.
7 1/2	x 9 "	runs from	350 to 475 R. P. M.



Four Cylinder Kerosene Engine

Write to-day for full details.

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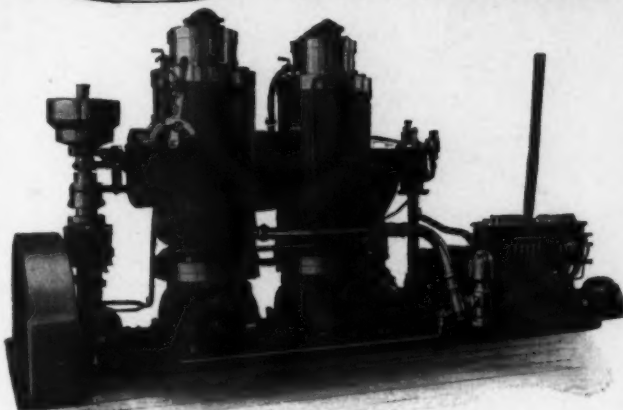
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Miller Motors are giving extreme satisfaction in every kind of service, the world over. They embody every essential feature for maximum efficiency and reliability. They offer the greatest value for your money because we have adhered to standard construction without wasting money on experimental designs.

Fourteen models, all four-cycle.  
Medium and heavy duty types.  
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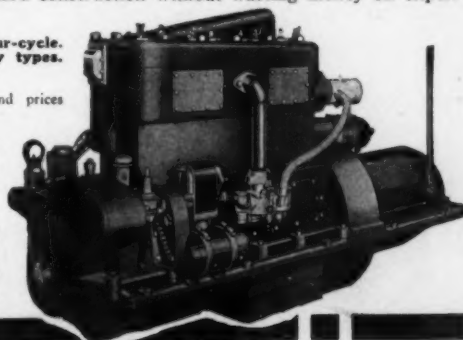
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You know the feeling of uncertainty that hangs over you when you try to run your boat after dark. It is a dangerous risk, a cause of nervous tension for the whole party so that no one enjoys the sail. As a result, you probably avoid night sailing although it is one of the most enjoyable forms of boating.

Equip your boat with a powerful searchlight. It will enable you to go out after dark as often as you please. You will find a new kind of enjoyment in gliding through the darkness, with a roving, piercing eye to pick out points on shore, avoid rocks and driftwood, recognize other boats, make a landing, find your mooring and countless other uses. It is like giving sight to a blind man.

"Golden Glow" Searchlights rob the night of all its dangers. They are the most practical searchlights for boat use because they give a peculiar yellow light which penetrates fog better than any other known light, and because the Golden Glow reflector can never tarnish from dampness or other natural causes.—it is glass.

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And you've got to paint your  
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And you want it to dry fast  
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Over the bright waves  
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*Built up to a Standard—not down to a price*

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**Model D-4, Medium Heavy Duty**  
36 Horse Power Bore, 4 1/4 inches Stroke, 8 inches

Quality construction throughout—in design, materials, workmanship, finish and equipment. Exceedingly compact for its power and exceedingly sturdy for its size.

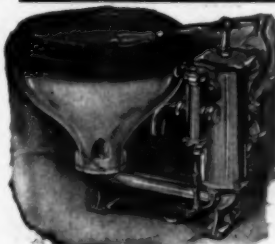
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Two small popular closets of low price but high quality—every boat should have one



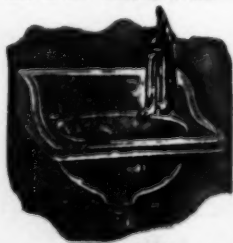
**"KNOCKABOUT"—PLATE S-34**  
(Patented—Copyrighted)  
The "KNOCKABOUT" Improved Pump Water Closet. Vitro-Adamant round flushing rim bowl, 2 1/2-inch combined supply and waste pump; "Sands" Patent Automatic Safety Supply Foot Valve and "Sands" Patent Back-Water Check Valve. Pump rough, finished trimmings, oak seat and cover. \$52.50  
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Dimensions: Front to back, 19"; width, 17 1/4"; height, 14". Weight: Net, 45 lbs. Shipping, 75 lbs.



**PLATE S-126**  
The "Glenora" Composition flat way sea cock.  
Price  
1/4 inch .. \$2.25  
1/2 " .. 3.00  
3/4 " .. 3.75  
1 " .. 4.50  
1 1/4 " .. 5.00  
1 1/2 " .. 5.50  
Size 2 1/4" and 3" also made.



**"WINNER"—PLATE S-2001**  
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The "Winner" Pump Water Closet. Vitro-Adamant Round Hopper Bowl, oak seat, N. P. brass hinges, 2 1/2" supply and waste pump. "Sands" special quick opening supply valve.  
Plate S-2000 Fixture as described \$24.00 with oak seat.....  
Plate S-2001 Fixture as shown \$25.00 with oak seat and cover.....



**PLATE S-3103**  
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Double Acting Brass Auto Bilge Pump, 15 inches long under spout and fitted with 5 feet of rubber hose.  
No. 1—1 1/2" diam..... \$3.00  
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No. 3—1 1/2" diam., 24" long, with foot rest..... 5.50

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Advertising Index will be found on page 102

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(Patented)

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For years past, in America and abroad, in the magnetos and lighting generators invariably identified with cars and trucks of notable dependability, "NORMA" Ball Bearings have been the standard bearings. Their preeminence in this field is the result of an unbroken record of satisfactory performance.

Be SURE. See that your Electrical Accessories are "NORMA" Equipped.



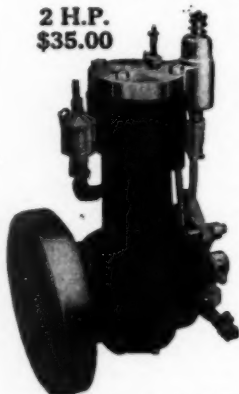
**THE NORMA COMPANY OF AMERICA**

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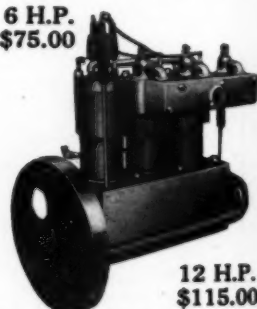
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\$35.00



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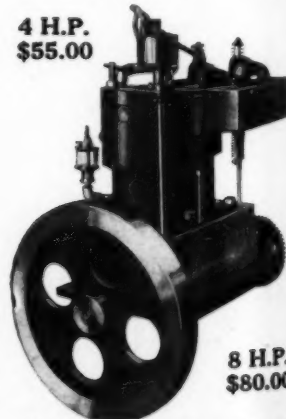
6 H.P.  
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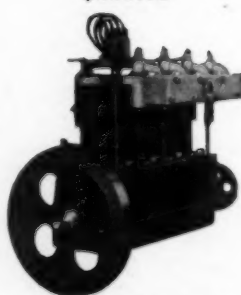
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4 H.P.  
\$55.00



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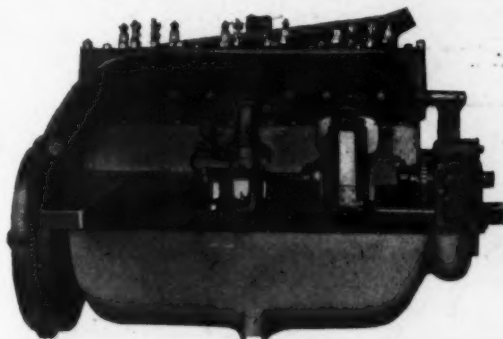
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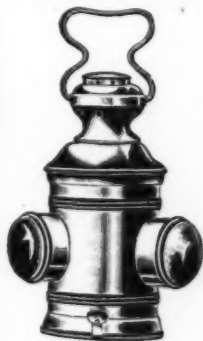


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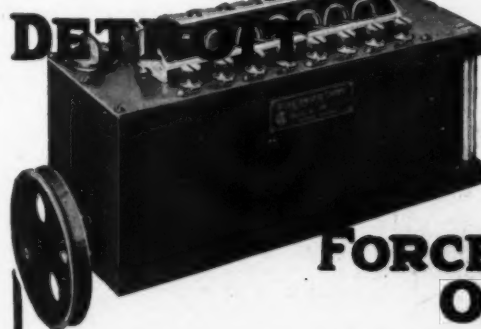
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for Safety

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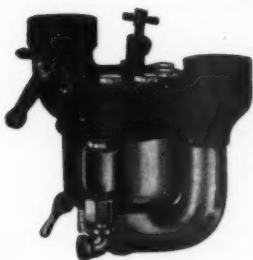
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Chicago, Ill.: 1430 Michigan Ave.

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
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The first Mullins boat was a big step forward in boat building—and for twenty-one years Mullins boats have been leaders in the field.

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Mullins boats, both steel and wood are designed by America's leading naval architects and built in the world's largest pleasure-boat factory. These facilities make it possible for you to obtain a better-designed, better-built, more serviceable boat—at the advantage of large-scale, low-cost production.

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HACKER CRAFT are designed and built under the personal supervision of John L. Hacker, designer of most of America's fast boats, and built by his own Company. They represent his latest work, and have back of them his 20 years of practical experience. They are the utmost in Swift-Luxurious Water Craft.

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**MOST EFFICIENT 32-FOOTERS EVER PRODUCED.**  
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They are quality forgings, produced by forgings experts, working with a degree of knowledge and experience in this work which is not equalled by any other organization.

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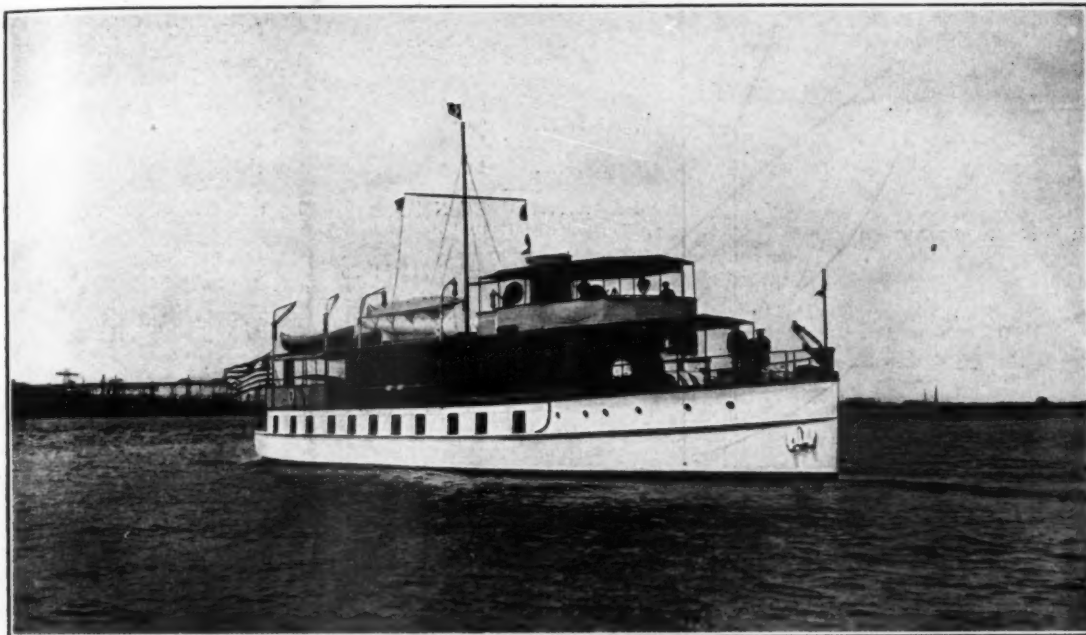
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## The Why and How of LA 2-Cycle Engines

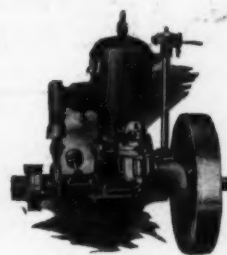
Why LA 2-Cycle Motors are Economical  
How LA Makes a Motor Boat of a Row Boat

Suppose you're going to the lake. Strap an LA Row Boat Motor to the running board of your auto; pack it in your camping kit, or take it as baggage.

When you arrive attach it to a row boat and you have a motor boat. The 2-cycle principle makes this handy motor what it is—practically a two-cylinder. Powerful—portable—economical—dependable.

### LA Row Boat Motor

Perfect in principle and performance—this is the verdict of engineering experts who have fully tested it. Being of 2-cycle design and without irreversible timing gears, it will run backward as well as forward, therefore a weedless propeller.



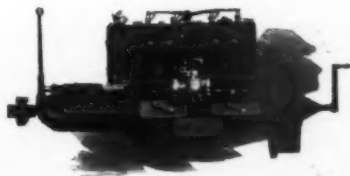
### LA 2-Cycle Inboard Motors

Two-cycle design gives these motors power ratings practically double 4-cycle design; plus simplicity, lightness, economy and reliability. The single and 2-cylinder models are the ideal small power plants for work or pleasure.

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For medium duty in pleasure or work boat—this 4-cylinder 4-cycle (model 44) engine, big brother of the LA family. Rugged and dependable.

Ask for the book that tells all about LA Marine Engines and all about Lockwood-Ash service. Also about the 30-day trial plan.



**LOCKWOOD-ASH MOTOR CO.**

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For heavy duty marine work there is a varnish that is guaranteed not to soften, peel, crack or turn white or blue, no matter how long it is submerged in either salt or fresh water, nor how hot the sun or how cold the storm—that's Kyanize Spar Finish.

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After the most severe tests, such as no varnish would be compelled to endure in actual service, Kyanize Spar was accepted and ordered for the United States Navy. It will give you the results you have always wanted. Packed only in the distinctive three-cornered can with the celebrated Kyanize label—be sure to get it.

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## Practical Navigation

(Continued from page 56)

C-W  $3^h 30^m 06^s$ , and the C.C. —  $2^m 43^s$ . Find the longitude and the deviation of the compass if the observed bearing of the sun's center was N  $72^\circ$  W at the time the sight was taken, the variation as taken from the chart being  $22^\circ$  W.

W.T. .... $4^h 10^m 12^s$	Obs. alt. @..... $25^\circ 26' 00''$
C-W ..... $3^h 30^m 06^s$	Corr. .... $+ 8' 16''$
C.T. .... $7^h 40^m 18^s$	Altitude ..... $25^\circ 34' 16''$
C.C. .... — $2^m 43^s$	Tab. 46..... $+ 7' 56''$
G.M.T. ... $7^h 37^m 35^s$ Aug. 1st	I.C. .... $+ 20''$
Eq. t. .... — $6^m 11^s$	Corr. .... $+ 8' 16''$
G.A.T. ... $7^h 31^m 24^s$	Eq. t. at $6^h$ = — $6^m 11.0^s$
Dec. at $6^h$ = $18^\circ 6.4'$	H.D. .... $0.1^s$
H.D. .... $0.6'$	Interval ... $0.6^s$
Interval ... $1.6^s$	Corr. .... $0.1^s$
Corr. .... $1.0'$	Dec. .... $18^\circ 5.4' N$
Dec. .... $18^\circ 5.4' N$	Eq. t. .... — $6^m 10.9^s$ say — $6^m 11^s$
Eq. t. .... — $6^m 11^s$	

Polar dist.  $71^\circ 54.6' = 71^\circ 54' 36''$   
 Altitude .....  $25^\circ 34' 16''$   
 Latitude .....  $36^\circ 51' 00''$  log. secant = 10.09680  
 Polar distance...  $71^\circ 54' 36''$  " cosecant = 10.02201

2)  $134^\circ 19' 52''$

Half sum.....  $67^\circ 09' 56''$  " cosine = 9.58891

Altitude .....  $25^\circ 34' 16''$

Remainder .....  $41^\circ 35' 40''$  " sine = 9.82208

Log. haversine of the local app. time..... = 9.52980

G.A.T. . =  $7^h 31^m 24^s$  Sun's azimuth  $86^\circ W$

L.A.T. . =  $4^h 44^m 43^s$  True bearing.. N  $86^\circ W$

Long. .. =  $2^h 46^m 41^s W = 41^\circ 40' 15'' W$  Obs. bearing.. N  $72^\circ W$

Total error...  $14^\circ W$

Variation ....  $22^\circ W$

Deviation ....  $8^\circ E$

Position of the vessel Lat.  $36^\circ 51' N$ , Long.  $41^\circ 40' W$ , deviation of the compass  $8^\circ E$ .

Note: The computation of the G.A.T. at which the sight was taken is carried out by the method outlined in the text. The declination of the sun, the equation of time and the correction to be applied to the altitude of the sun's lower limb are found by the methods explained last month. The logarithms are found from table 44, the interpolation being done by inspection. The logarithm of the haversine of the L.A.T. might seem to be 39.52980, but as usual the figure to the left of the first number to the left of the decimal point is dropped. The L.A.T. is found from the log. haversine by the use of table 45, no interpolation being necessary. The true bearing of the sun was obtained from the azimuth tables. Final answer is given to the nearest minute.

Problem 2. On May 6, 1918, the a. m. position by dead reckoning is Lat.  $31^\circ 18' S$ , Long.  $170^\circ 19' E$ . A series of altitudes of the sun were taken for determining longitude and at the same time an observation of the bearing of the sun was taken for determining deviation of the compass.

C-W .....  $0^h 23^m 11^s$

C.C. .... —  $2^m 12^s$

Height of eye..... 21 ft.

Index correction .....  $+ 3' 10''$

The sun bore  $67^\circ$  by compass, the variation being  $2^\circ W$ .

The watch times of the sights and the altitudes were as follows:

W.T.  $8^h 04^m 40^s$  Obs. alt. @  $13^\circ 26' 00''$

$8^h 05^m 05^s$   $13^\circ 30' 10''$

$8^h 05^m 45^s$   $13^\circ 37' 20''$

Find the longitude and the deviation of the compass.

W.T. ....  $8^h 04^m 40^s$  Obs. alt. @.....  $13^\circ 26' 00''$

$8^h 05^m 05^s$   $13^\circ 30' 10''$

$8^h 05^m 45^s$   $13^\circ 37' 20''$

3)  $24^h 15^m 30^s$  3)  $39^\circ 93' 30''$

Mean ...  $8^h 5^m 10^s$  Mean .....  $13^\circ 31' 10''$

C-W ....  $23^m 11^s$  Corr. ....  $+ 10' 44''$

C.T. ....  $8^h 28^m 21^s$  Alt. ....  $13^\circ 41' 54''$

C.C. .... —  $2^m 12^s$

G.M.T. .  $8^h 28^m 09^s$  May 5 Tab. 46..... =  $+ 7' 34''$

Eq. t. ...  $+ 3^m 24^s$   $+ 3' 10''$

G.A.T. ..  $8^h 29^m 33^s$   $+ 10' 44''$

(Continued on page 84)

*"We Can Thank Pyrene! When the Motor Boat Caught Fire It Saved Your Lives."*



**Pyrene**  
KILLS FIRE  
SAVES LIFE

Motor boats sometimes catch fire and a gasoline fire spreads fast. Every summer takes its toll of death. There are many cases on record where a Pyrene extinguisher on a motor boat could have saved lives.

Pyrene is the one ideal fire extinguisher for a boat. Sure. Quick. Simple. Death to a gasoline blaze.

Is your boat equipped with Pyrene? If not, buy today.

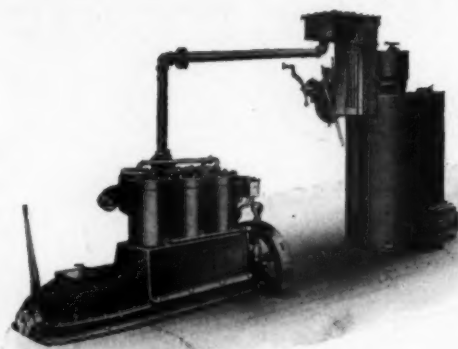
Buy it because it protects your life.

Buy it because it protects your boat.

Buy it because it saves you money.

Sold by hardware and auto supply dealers.

**PYRENE MANUFACTURING CO., NEW YORK CITY**



The Galusha Gas Producer provides the most economical marine power known for freight boats, passenger boats, towboats and land power plants.

## Saves \$540 a Month in Fuel Cost

Chicago, Ill., Sept. 29, '17.

Mr. H. Jacobsen,  
25 No. Dearborn St., Chicago, Ill.

I have a 50-H.P. Galusha Gas Producer in connection with a 60-H.P. Engine installed in my Passenger Boat the "CHICAGO" plying between Lincoln Park, the Municipal Pier and Grant Park.

Here is a brief report or data of the operation during this summer:—

I have run my boat every day, (a few rainy days excepted) from about 9 A. M. to 11 P. M. without losing one minute, and I run the engine "dead slow" at the docks without any danger of stalling. This shows absolute reliability.

The consumption of Pea Coal has amounted to not over 1½ tons of coal a week or a cost per day of less than \$2.00, while gasoline would have cost me \$20.00 per day, a saving in cost of fuel of some \$540.00 per month. This is real Economy.

I have run my boat all day in storms and heavy seas, when all the "double deckers" had to tie up at their docks, and this weather did not interfere with the operation of the gas producer at all.

To prove my satisfaction, I will add, that I shall most certainly install this kind and make of power in my next boat.

Very truly,

FRED WEIMER

**NELSON BLOWER & FURNACE  
COMPANY**

Elkins & L Streets South Boston, Mass.

## Practical Navigation

(Continued from page 82)

Eq. t. May 5 at 8<sup>h</sup> = + 3<sup>m</sup> 23.8<sup>s</sup>

H.D. .... 2  
Interval ..... 4

Corr. .... 0.1

Eq. t. .... = + 3<sup>m</sup> 23.9<sup>s</sup> say 3<sup>m</sup> 24<sup>s</sup>  
Dec. May 5 at 8 = 16° 11.6' N

H.D. .... 0.7  
Int. .... 4

Corr. .... .3

Dec. .... 16° 11.9' N  
90° 00.0'

Polar dist. .... 106° 11.9' = 106° 11' 54"

Altitude ..... 13° 41' 54"  
Latitude ..... 31° 18' 00" log. secant = 10.06831  
Polar distance.... 106° 11' 54" " cosecant = 10.01759

2) 150° 71' 48"

Half sum..... 75° 35' 54" " cosine = 9.39571  
Altitude ..... 13° 41' 54"

Remainder ..... 61° 54' 00" " sine = 9.94553

Log. haversine of the L.A.T. .... = 9.42714

L.A.T. ... 19<sup>h</sup> 50<sup>m</sup> 54<sup>s</sup> 180°  
G.A.T. ... 8<sup>h</sup> 29<sup>m</sup> 33<sup>s</sup> Azimuth from tables. 119° E

Long. ... 11<sup>h</sup> 21<sup>m</sup> 21<sup>s</sup> = 170° 20' 15" True bearing..... 61°  
Obs. bearing..... 67°

Error ..... 6° W  
Variation ..... 2° W

Deviation ..... 4° W

Position of the vessel, Lat. 31° 18' S, Long. 17° 21' E.  
Deviation of the compass, 4° W.

Note: The sight was taken at about 8 a. m. in longitude 170° E, at which time it would be evening of the day before at Greenwich. Hence the G.A.T. and date. The declination of the sun was northern and the latitude southern so the declination was added to 90 to get the polar distance.

## Go Into Commission This Spring

(Continued from page 7)

partially analyzed, one would find that the consumption of gasoline by all the motor boats in existence used for pleasure and recreational purposes amounts to only a fraction of a per cent. of the total production. If the total consumption were cut off the net change would be absolutely nil.

To date the Government has announced absolutely no restrictions on the use of motor boats upon the navigable waters, either inland, coast-wise or offshore. It is highly improbable that any restrictions will be placed on navigation. Those few which were in vogue last summer, yet seldom enforced, may be withdrawn altogether. Even in its worst state all that the Government could require would be a license. But this would be granted to every citizen for the asking.

Probably no organizations in the country have contributed more largely and generously of their membership to the military and naval branches of the Government since April 6, 1917, than the yacht and motor boat clubs of the country. In some instances thirty-five per cent. of the membership have joined the colors. The consequent loss in income due to this loss of membership must be borne by the club members who stay at home, as invariably the clubs have remitted the dues of those members who are in the service. Thus the members can return and have the same standing in their organizations as when they left. For this reason club members should support their clubs during the war even in spite of the additional tax on club dues and many other extra charges which the members are called upon to bear at present.

Club members who have not joined the colors have in general responded most generously to any call for patriotic efforts which has been issued. Some organizations have done far-reaching work along educational lines. The Hudson River Power Squadron, for example, has maintained a free nautical school every night since war was declared a year ago. Over 1,000 young men have been prepared for the Navy or given instruction in things nautical in a three months' course in New York City given by the officers and members of this organization.

Club racing events and other national racing fixtures should be held as usual. The intrinsic value of the prizes may be reduced if desired but the training and experience which the crews get, especially in the long distance events, is something which we can ill afford to curtail even temporarily.



# The Biggest Thing in Motor Ignition



During the last four years wonderful strides in motor efficiency have been made, yet spark plug practice has remained embound by the limitations of porcelain, cement, wire electrode points, gaskets, lock-nuts, etc. This construction, always questionable, is impossible for the requirements of present day motors. The designers and users of high speed motors of all kinds have had their efforts seriously handicapped by this deficiency in spark plugs. At this time of greatest need, like a Phoenix, from the smouldering fires of distraction, rises the

## DODWILL Air-Cooled Spark Plug

to definitely and finally solve the problem.

We call it the "three-point plug," because in three respects it stands pre-eminent in its accomplishments. But throughout it has simply cut loose from custom and prejudices. It has evolved new principles of construction. It treads new paths; it has met the need.

### ↓ Point One ↓ Positively Unbreakable

The core is mica, scientifically made, and cannot chip, crack or break like porcelain. Held without mechanical appliances of any kind, the entire plug is a composite whole that will stand up under any kind of use or abuse.

### ↓ Point Two ↓ Efficiently Air-cooled

The electrode is a single piece provided with a copper heat-distributor, and cooled by air-circulation. The shell is finned throughout. Result 40% to 50% cooler electrode points and a tremendously more vigorous and snappy spark.

### ↓↓ Point Three ↓↓ Absolutely Leak-proof

Porcelain, lock-nuts, washers, and cement are all eliminated with their many varieties of trouble and uncertainty; the core is tested to 35,000 volts. Eternally gripped by contraction, it is both compression and electrically leak-proof.

And then,—this is too valuable to overlook! See those electrode points!!! No wires to vary in adjustment, to loosen, to fall out. Ball Knobs, solidly imbedded, that concentrate the potential into a vigorous, snappy spark.

Study these features, apply them to your problem, Messrs. Manufacturers and Users of high-speed motors, airplane, motor boat, or automobile.

## This Plug Solves Big Ignition Problems

and has won the instant approval of many of the most able Engineers, and experts of motordom, who have spoken for practically our entire possible output. If you are interested, we'd like to tell you about it—just ask us.

**DODD, WILLIAM MFG. CO., Inc.**

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Its tough, waterproof finish withstands the roughest elements. It never turns white, cracks, checks, nor peels.

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Wisconsin Motors are known for their ability to get maximum power out of every gallon of gasoline. Quiet, smooth running, light and compact, they are the product of the highest type of engineering skill.

## Wisconsin Motors

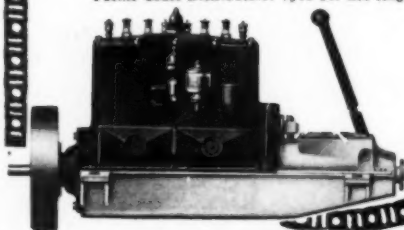
for marine use contain those same qualities that have made Wisconsin Racing Motors champions of the world on road and speedway. If it's a Wisconsin it's a consistently dependable motor.

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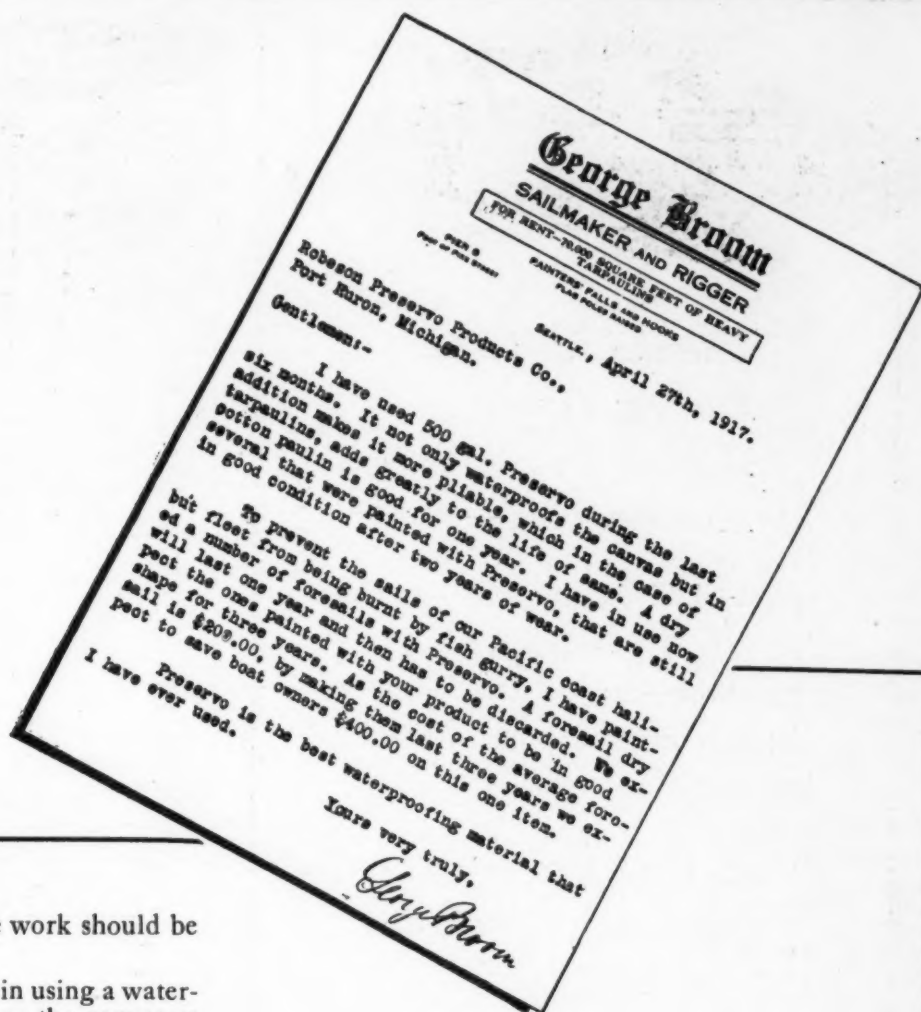
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ALL canvas used in marine work should be water-proofed.

Yet there is necessary waste in using a water-proofing that does not *preserve* the canvas as well as making it water-proof.

The safe way to protect your canvas investment is by insisting upon having *every* yard of canvas you use treated with *Preservo*.

You have only to read Mr. Broom's letter to see how *Preservo* makes good in the *most severe kind of marine work*. A water-proofing that will successfully withstand the affects of fish gurry and *more than double* the life of the sails, will insure indefinitely greater wear when applied to canvas for other marine uses.

Canvas treated with *Preservo* remains soft and pliable—its wearing qualities are practically doubled. It is proof against mildew and decay.

*Owners of Yachts, Cruisers, Work Boats,  
Small Motor Boats*

can affect a big economy by using canvas that has been treated with *Preservo*.

For hatch covers, engine covers, spray hoods, dinghy covers, etc., there is nothing that

will equal the absolute waterproofness and wearing qualities of *Preserved* canvas.

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This sample will show you the effect of *Preservo* and how soft, pliable, and wear-resisting it makes the canvas.

For special literature regarding *Preservo* canvas address our nearest office. For free sample of the *Preserved* canvas, write our home office.

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Kindly send me a sample of  
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**Preservo**  
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**Thanks to  
Berling Quality,  
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now doubled—**

—100% increase in Berling capacity, as per above addition to the big Berling plant—

—Such is the reward of superior magneto-quality, and conscientious effort to serve.

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# Berling Magneto



*Worth more  
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See prize winning articles in February Issue (page 24) of "MoToR Boating," which describes successful and permanent repairs on scored cylinders made with Smooth-On Cements. Smooth-On Cements are easily applied. They expand and contract with the metal to which applied and when metalized are not affected by heat, cold, water, gasoline or oil. A permanent repair for leaks in water-jackets, engines, boilers, tanks, screw-thread joints, flanged joints, etc. Write for Free Illustrated 144-page Book on Smooth-On Products.

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**A Marine Engine  
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Incorporates a silent and thoroughly efficient rotary valve which is always gas tight and silent and can never stick.

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Masten's Patent



This invention provides a life preserver garment that may be worn constantly with comfort and convenience, as it does not hamper the wearer in his normal movements, permitting him to pursue his work, while at all times he is prepared for an emergency. It contains no air cells to be punctured and is sufficiently buoyant to float four persons fully clothed for an indefinite period.

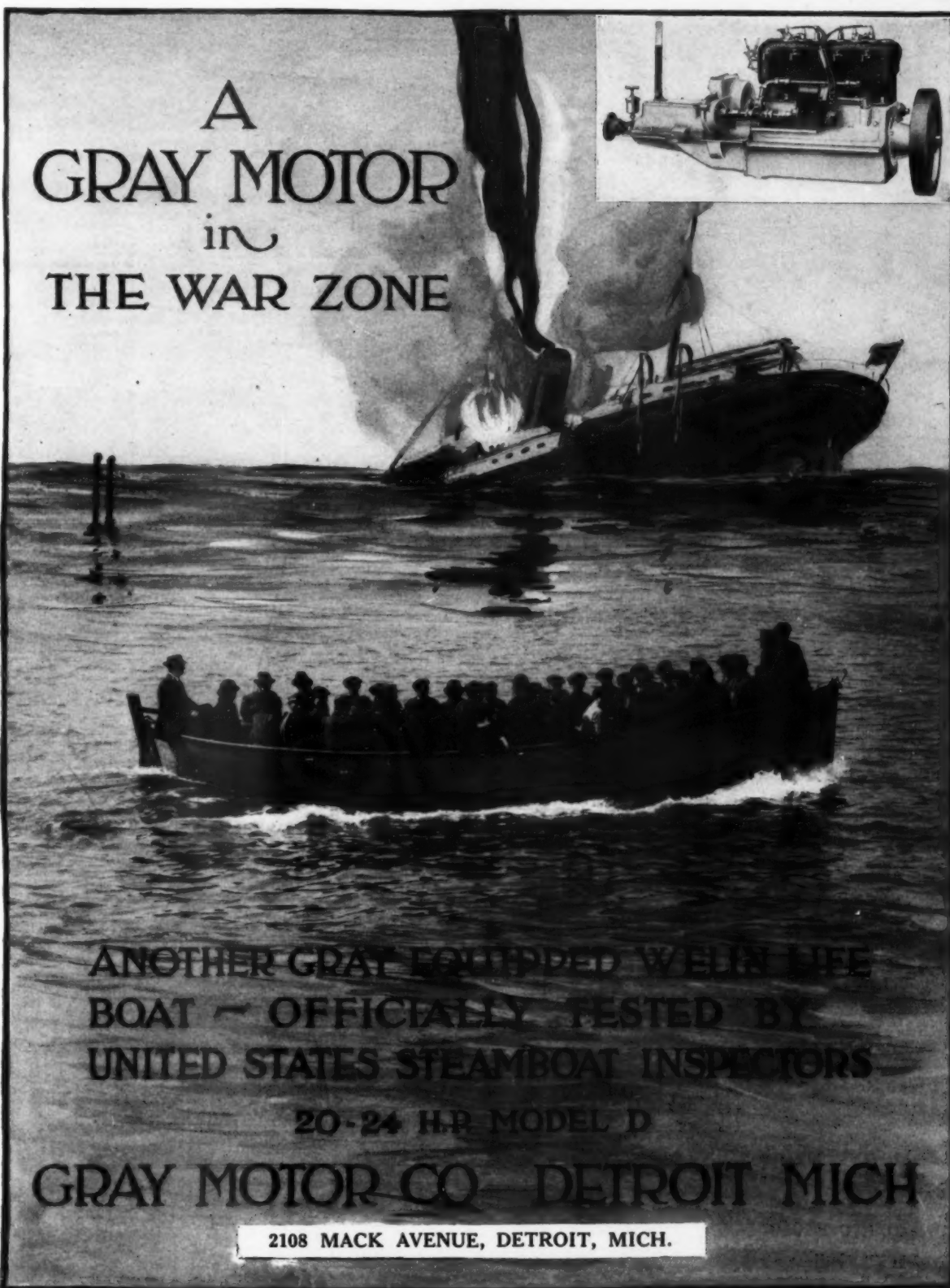
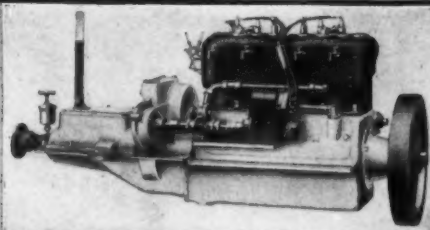
It is light in weight, and in cold and inclement weather adds greatly to the comfort of wearer. An important feature is the collar, which contains sufficient buoyant substance to float the head even though the wearer becomes unconscious.

All persons entering the war zone and all motor boat owners, yacht owners and persons traveling by water should include our patent Life Preserver Jacket in their outfit. IT IS A CHEAP WAY TO INSURE YOUR LIFE AND THE LIFE OF YOUR WIFE AND CHILDREN AGAINST DROWNING. YOU CAN'T DROWN!

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ANOTHER GRAY EQUIPPED WELIN LIFE  
BOAT - OFFICIALLY TESTED BY  
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GRAY MOTOR CO. DETROIT MICH

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## Buy a Good Motor

The only motor you can afford to own is the best motor you can buy. Steady service, high efficiency, good economy and freedom from mechanical troubles are more important than a few dollars saved on the first cost.

It costs real money to build good motors these days. Present material and labor costs have necessarily advanced prices somewhat. You must expect to pay a little more. You get just what you pay for—only the bargain hunter gets less than his money's worth.

Prices may not go down for several years to come. They may advance several times before they recede. You can save nothing by waiting. Buy your new motor now, and enjoy life while you can—but buy a **good** motor—for real service.

Practically every better grade motor on the market today carries a Paragon Reverse Gear as standard transmission equipment. That in itself is an indication of the manufacturer's policy — whether it is "Quality" or "Price."

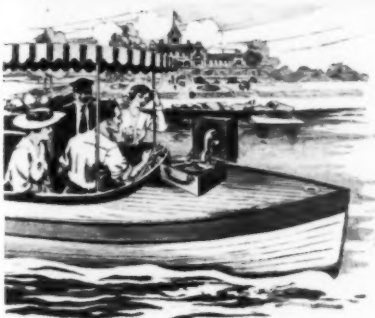
## PARAGON GEAR WORKS

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A splendidly illustrated booklet that tells how to pick the right motor for your boat. The supply is limited.

WRITE NOW.



Music is most acceptable to pass the time away aboard the yacht or trim cruiser. When conversation lags, the Sonora Portable offers the music of the world. Here is a source of unalloyed pleasure instantly available anywhere.



The automobile nowadays enables you to leave the city behind and in a few hours, out in the open country, the luncheon is served. Then the Sonora Portable is started and entertains the party as pleasingly as could the restaurant orchestra in town.



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The men in camp and at the front find the Sonora Portable a never ending source of pleasure. Here is the ideal gift for your sailor or soldier boy.



WHY leave music at home? You men and women who enjoy cruising and motor trips will wonder how you ever got along without the pleasure and entertainment given by the remarkable

## Sonora Portable

This is a quality phonograph that you can take with you wherever you go. The Sonora Portable is characterized by the beauty and resonance of tone which has made the name Sonora signify the Highest Class Talking Machine in the World.

*The Sonora Portable weighs only 15 pounds complete.* Plays all makes of disc records, all sizes. Has handsome polished leather case.

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**Sonora Phonograph Sales Company,**

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Executive Offices: 279 Broadway, New York

*Dealers established throughout the country*

## Spring Axioms

(Continued from page 21)

what a little "one lugger" will do when geared to a winch. A capstan would make him run 'round in circles in more ways than one.

A few boats are put over with all the equipment aboard, but that is more generally the exception than the rule, and many an owner who spent hours on the painting will launch his ship, make fast to the dock without using his fenders, and be sorry for months.

It takes time, generally several weeks, for the fresh paint to become really hard, so that the safest way is to have the mooring all ready, make fast to it, and bring the last odds and ends of equipment out in the tender. See that the anchors, cables, and other heavy or bulky gear is put aboard just before launching.

Too much caution cannot be taken to have the boat securely blocked on the cradle or car before she takes the ways. There is bound to be more or less jolting, and unless the blocking is in tight a spill is not a remote possibility, and with a heavy boat the results are disastrous.

It is far better to spend ten minutes making sure of the blocking than a half day righting a capsized boat—with the chances of cracked frames or broken planking. Some boatmen prefer to spike the cradle and blocks together, and others depend on rope to do the trick.

To start the season right, without worries and troubles, don't rush things, be sure that your boat is ready for the water and use all possible care in getting it into its natural element. Nothing is more discouraging than an accident at the launching.

## Tools and the Motor Boat

(Continued from page 30)

fine teeth for cutting small pipe or tubing while blades with coarser teeth will cut heavier metal much quicker, and when cutting or working on small pieces a vise is practically a necessity.

Screws, bolts, cap screws, and small pipe connections sometimes break off, and to replace them the broken pieces will generally have to be drilled out and sometimes the thread will have to be re-cut. For this work a hand drill with a set of twist drills and a few taps for both bolt and pipe threads should be part of the equipment. When the hole required is larger than the drills carried, a fluted reamer will do the work quicker and easier than a round file. A center punch will be needed to start the drill in the right location.

It is sometimes desirable to make some changes or repairs to the piping about the motor or the cockpit awning frame and a set of pipe dies will be needed. A set of Armstrong pipe dies, which are adjustable, are about the best for such work, and in addition, cutters for standard bolt threads can be had for use in the same stock, making the most complete set that can be carried in a small space.

There is never a season passes but what some changes or repairs to the woodwork will be necessary and for this work some simple carpenters' tools should be included in the cruiser's equipment. It goes without saying that a cross-cut saw and claw-hammer will be necessary and a block plane will help to give a finish to the work. A try-square and folding rule will be necessary to mark out the work. A brace and set of bits will prove useful in many different ways, and will probably be used on everything from the keel to the mast.

For boring small holes, driving screws and countersinking the heads there is nothing handier than a Yankee spiral ratchet screwdriver with its various attachments. A couple of chisels will be found useful, as also will a hatchet for roughing out pieces to be finished with the other tools. A caulking iron and marlin spike will be particularly useful when fitting out.

**Set of tools for the small open boat.**  
1-pound ball peen machinist's hammer  
3-inch screw-driver

7-inch slip-joint pliers  
10-inch pipe wrench  
10-inch all-steel wrench  
3/4-inch cold chisel  
10-inch flat file  
Spark plug and coil file

**Set of tools for the small boat that is seldom far from its home port.**

1-pound ball peen machinist's hammer  
6-inch screw-driver  
3/4-inch screw-driver  
7-inch slip-joint pliers  
16-inch pipe wrench  
8-inch pipe wrench  
10-inch all-steel wrench  
6-inch all-steel wrench  
10-inch flat file  
6-inch triangular file  
3/4-inch cold chisel  
3/8-inch round nose cold chisel  
Spark plug and coil file  
About four-double head engineer's wrenches  
Cotter pin extractor  
Revolution counter

**Set of machinist's tools for a cruiser**

1 1/4-inch pound ball peen machinist's hammer  
6-inch screw-driver  
3/4-inch screw-driver  
7-inch slip-joint pliers  
10-inch all-steel wrench  
6-inch all-steel wrench  
20-inch monkey wrench  
18-inch pipe wrench  
8-inch pipe wrench  
10-inch flat file  
10-inch round file  
6-inch triangular file  
3/4-inch cold chisel  
3/4-inch cape chisel  
3/8-inch round nose cold chisel  
5-inch side cutting pliers  
1/4- and 3/8-inch pipe taps  
Adjustable hack-saw frame  
A dozen hack-saw blades  
Cotter pin extractor  
Spark plug and coil file  
Fluted reamer  
Center punch  
Hand drill  
Set of twist drills  
Bolt taps of sizes suitable for motor  
Small vise  
Revolution counter  
Set of engineer's wrenches of suitable sizes

**Carpenter tools for a cruiser**

24-inch cross-cut saw  
1-pound claw-hammer  
Medium-size hatchet  
7-inch brace  
Set of bits  
1-inch chisel  
3/4-inch chisel  
5-inch block plane  
8-inch try-square  
Folding rule  
Nail set  
Yankee screw-driver with drills and countersink.

## Serious Defects Sometimes Hidden

(Continued from page 34)

If a motor with weak compression is several years old, and has seen hard service, the suspicion of worn cylinders and pistons is justifiable. In this case, oversize pistons may be needed, and the cylinders may have to be re-bored. It would be very unwise to purchase a motor needing such extensive repairs.

Be sure, moreover, that you select a motor that is suitable for your boat. Do not get a high-speed, light-weight outfit for a cruiser, or a heavy-duty motor for a runabout. That an automobile motor is entirely unsuited to a motor boat is a rule with almost no exceptions.

One cannot, of course, expect perfection in a second-hand motor. Such defects as worn bearings and piston rings are easily repaired, and do not involve much expense. I should consider the following defects sufficient to condemn a second-hand motor, under any but exceptional conditions.

- (a) Repair parts unobtainable.
- (b) Worn or badly scored cylinders and pistons.
- (c) Badly cracked enbloc cylinder casting.
- (d) Sprung crankshaft.
- (e) An engine with numerous minor defects, which has had several years of hard service, and may, therefore, be expected to develop other, and perhaps more serious, defects.

W. K. B., Ann Arbor, Mich.

## Motor's History Important

(Continued from page 35)

attention as they are of prime importance in any machine. Raising the flywheel with a lever to disclose possible play in the main bearings, rocking the flywheel over and back to detect play in crankpin and wrist pin bearings and moving the camshaft up and down with a

screwdriver will usually disclose any serious wear in any of these locations. Of course, it would be the surest way to take down the entire motor or to employ a good engine man to do it for you in case you distrust your judgment or mechanical ability. It is seldom, however, that the opportunity for so searching an investigation is allowed.

We should next test the compression of the cylinders by turning the motor over with compression cocks closed. The feeling should be one of smooth rotation with an ever-increasing and elastic resistance toward the top of the stroke. This resistance will often test the limit of a man's strength to overcome, should the motor chance to be one of some size. Should lack of compression be encountered it would probably indicate one of the following ailments: Piston rings broken or stuck, valves warped, pitted badly or broken, or valve stem stuck in its guide. If the compression is poor then locate the cause and see if the remedy is likely to prove too costly.

Having systematically and conscientiously gone over the motor piece by piece, and so far as possible satisfied himself as to its present condition, the prospective purchaser should take pains to learn what he can of the motor's history. Whether it has ever been abused, exposed to the ravages of fire or perhaps been submerged for weeks in a sunken wreck to be finally salvaged and placed upon the market. Such happenings are far from infrequent occurrence and have a very great bearing upon the value of the motor.

If the machine measures up to all requirements and the price is fair, nothing remains but to close the bargain and await the final test to prove your judgment sound or faulty. The test of operation in the boat, which after all is the only real test of a motor.

A. O. G., Portland, Me.

## The Navy Needs Your Eyes

(Continued from page 10)

probably not enough sextants in the country to-day to supply the Navy's needs, unless the merchant marine be robbed, and that, of course, is impossible. Hence the Navy wants not only sextants, but quadrants, octants—anything that has lenses and a mirror. The optical glass shortage extends to the fine plane mirror glass of the sextant. No matter how old or out of date an old sextant, octant or quadrant may be, if it has a good mirror, it is welcome. Both the mirror and the lenses can be fitted to a new and modern mount, and become useful, patriotic aids to Uncle Sam at sea.

To make this demand known, the Navy has asked all yacht clubs to publish this need on their bulletin boards, and it is hoped that response will be as liberal and as patriotic as has that from the country at large for glasses. For this is a real need. It is not a case of wanting to get instruments without paying for them—it is a case of not being able to get instruments at any price. The only way the Navy can get what it needs now is through you, and you and YOU—and your patriotism, which regards the Navy's need as greater than your own, and your glass, sextant and chronometer as of more value to Uncle Sam than to your own boat.

When you send a contribution, tag each article securely with your name and address and direct it to the Hon. Franklin D. Roosevelt, Assistant Secretary of the Navy, United States Naval Observatory, Washington, D. C.

## Aerial Mail Service

(Continued from page 15)

Alaska and to Pershing's Army in Mexico, and although the airplanes were not specially designed for the purpose the results were far beyond the expectations. It is undoubtedly only a matter of time before all the important industrial centers will be served by aerial mail routes. The only delay in organizing the service at once is the necessity of concentrating the entire airplane-building resources of the country on machines for war service.



# Frisbie an' I

**MY!  
How We  
Do  
Hooverize  
on  
Repairs!**

**E**XCESS baggage! That's what Mr. Hudson calls the extra parts he carries around in the "Half Moon." The "Half Moon" is 32' x 8' 6", powered with a 4-cylinder 30 h. p. Frisbie Motor that has never had any repairs, except regrinding the valves, for *three seasons!* Though some of the runs were long and the going stubborn, the Frisbie has *never once failed him.*

Mr. Hudson says the valve-in-the-head design is one reason for the fine service he received. Then he lowers his voice and adds, confidential like: "but, if you'll allow me to say so, I believe your square-dealing business policy had something to do with the Frisbie's success." Write Mr. L. S. Hudson, Stony Brook, N. Y., for complete details—you'll find them typical of Frisbie performance.



*The Friendly Motor*

**Makes  
Fine  
Record**

## Get the FRISBIE BOOK

Don't start the season without it. It's free and describes the entire Frisbie line from 1 to 6 cylinders and 3 to 75 h.p. Full of boating pictures and interesting performances, and has much good motor data. Write—we mail it *quick!*

**In the "Half Moon"**

**The  
Frisbie Motor Co.**

7 College Street  
MIDDLETOWN, CONN.



# DEVOE GUARANTEED MARINE SPECIALTIES



## VERNOSITE

To everlastingly protect and beautify your finished wood-work use VERNOSITE. It is the original long-life spar varnish, guaranteed for use on spars, rails, cabins, deck-houses and cedar or mahogany hulls. The durability of its clear, brilliant finish has long been established. Look for the Guarantee Formula on every can. There is nothing in VERNOSITE to scratch or turn white, check or blister. All-season satisfaction is assured by using this water-proof, wear-proof varnish.

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This semi-gloss marine white is the standard of quality in every boat yard. It retains its attractive eggshell finish without cracking, flaking or changing color. Hard scrubbing will not injure it. Nothing equals Columbia Yacht White for topsides, deckhouses and the finest yacht work.

## DEVOE DECK PAINT

Wear-resisting qualities are at their maximum in DEVOE Deck Paint. It is specially made to be continually walked on and to withstand the severest weather exposure. Insist upon DEVOE Deck Paint for your decks, cabin floors and your porch floor at home. Ready for use in many attractive colors.

## BATTLESHIP GRAY

With so many crafts enrolled in the Scout Patrol Service, this is the season's popular hull paint. Made in accordance with U. S. Navy standard specifications. It is a practical and serviceable gray for cruisers, yachts and motorboats.

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*Send for this free booklet and get the best results in fitting out your boat.*

## COLUMBIAN PROPELLERS



### WIN FIRST AND SECOND AT MIAMI REGATTA

At the Fourth Annual Miami Regatta held at Miami, Fla., February 27th and 28th, Columbia Propellers were used on the two boats that won first and second in the Open Displacement Boat Race.

"Hoosier II" (the boat to the right) won the first day's race in a spectacular manner. On the second day she ran second. "Hoosier II" is a 35 foot Albany Fast Runabout powered with an eight cylinder Sterling engine operating a Columbia Propeller at 1475 R.P.M.

"Stroller" (the boat to the left) won the second day's Open Displacement Boat Race at the average speed of 32.31 M.P.H. "Stroller" is a 30 foot Albany Fast Runabout, built in 1913 and powered with a six cylinder Van Blerck engine operating a Columbia Propeller at 1500 R.P.M.

In addition to which, "Betty M. III", Com. C. W. Kotcher's 48 foot Express Cruiser which won the limited Express Cruiser race uncontested, used a pair of Columbia Propellers in connection with his pair of six cylinder Van Blercks.

Additional convincing proof that Columbia Propellers are used by the majority of really worth while boats, by the majority of boats that really do things. Where propeller service a little out of the ordinary is required Columbia Propellers are called upon to do the work and they always stand up against it and render an efficient and dependable service.

No matter what your boat may be, from a heavy work boat to a small, light power boat—there is a Columbia Propeller properly designed and built for your requirements. Write to-day for "Propellers-in-a-Nutshell" an interesting little booklet full of valuable data for you.

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Executive Offices: 50 Church Street, New York City

New York City Local Salesroom: Concourse, 50 Church Street

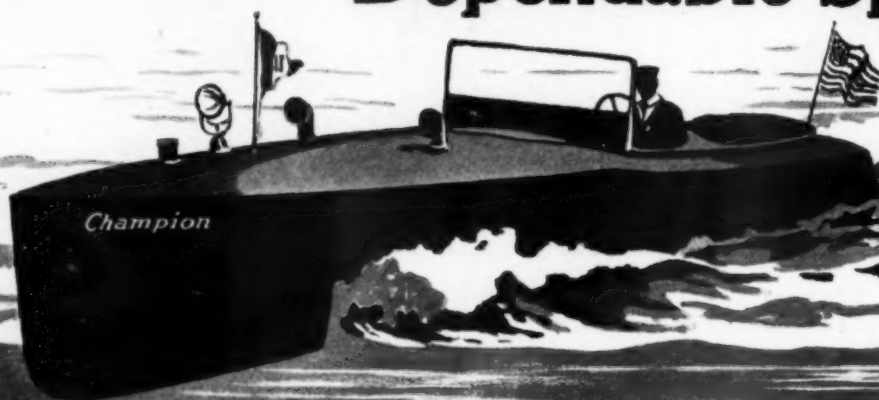
Factory: Freeport, L. I.

Address all correspondence to the Executive Offices except for New York City Sales



# Champion

## Dependable Spark Plugs



### The Champion "Spark-in-Water"

That spoil-sport of motor boating, the moisture-shortened spark-plug, is easy to avoid.

This Champion will actually spark *in water*.

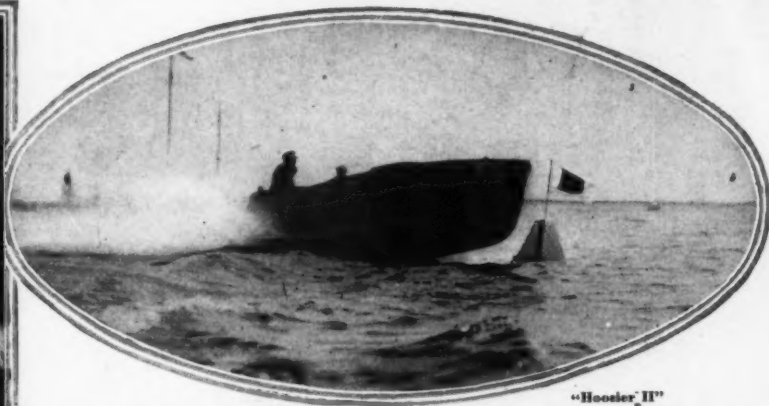
Just ask your dealer for the Champion "Spark-in-Water" Plug.

It is the standard plug wherever there is water for motor boating.

All dealers sell it and the price is \$1.25.

Get a set of these plugs—and be sure "Champion" is *on the porcelain*—that's your guarantee of dependability.

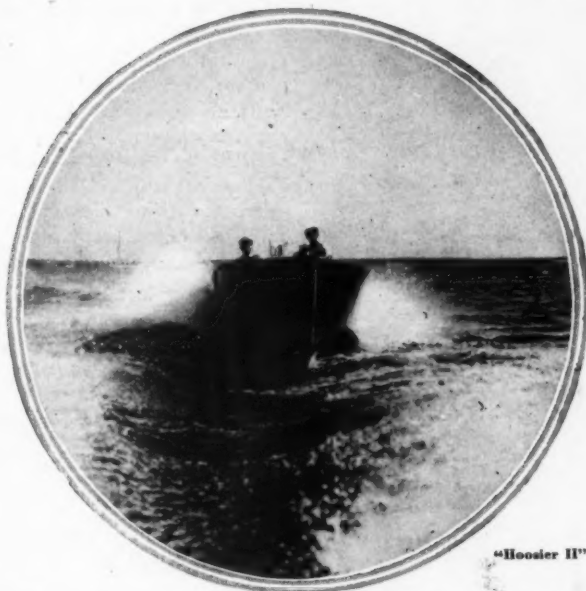
**Champion Spark Plug Company**  
TOLEDO, OHIO



"Hoosier II"

### Albany Boat Wins at Miami Regatta

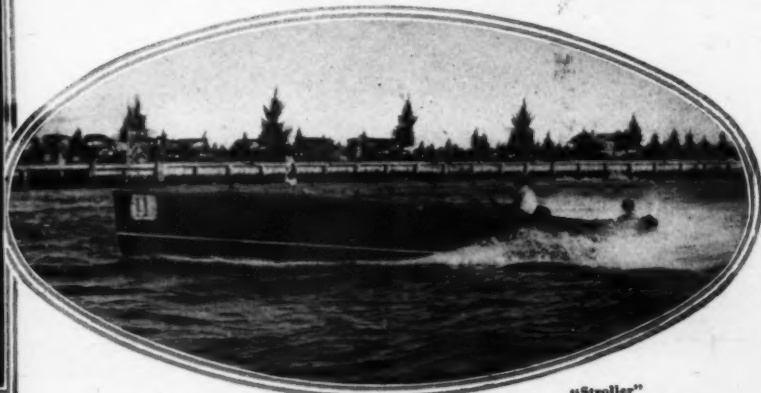
AT the Regatta held at Miami, Fla., Albany Standardized Fast Runabouts won first and second place in their class. "Hoosier II," owned by Mr. H. R. Duckwall of Indianapolis, a 35-foot Albany Fast Runabout, won first place in the first race, second place in the second race and won first place in the series, thus winning the Miami Championship Flag. "Hoosier II" is a standard 35-foot Albany Fast Runabout, no different in any way from other Albany boats of the same size.



"Hoosier II"

THE second day "Stroller" came out from behind and won first place, averaging 32.31 M.P.H. on a course with many turns. "Stroller" is a 30-foot Albany Fast Runabout built in 1913 and is owned by Mr. E. C. Romfh, Pres. First National Bank of Miami. Used persistently for five seasons and starting her sixth by winning this big race is a remarkable record for any boat, but is characteristic of the service rendered by Albany Boats.

Write to-day for booklets describing the  
ALBANY FAST RUNABOUTS and EXPRESS CRUISERS  
Albany Boat Corporation, Watervliet, N. Y.



"Stroller"

Albany  
BOATS

# Where Power Is Needed

Power efficiency measures the amount of work done, miles covered, time consumed, and cost of operation; and power efficiency is determined by the piston rings. To be assured of the sustained maximum requires an equipment of

## McQUAY-NORRIS **LEAK-PROOF** PISTON RINGS

Get more power out of your motor or engine. Stop the continual waste of fuel, oil and time caused by worn and leaky piston rings. Install McQuay-Norris **LEAK-PROOF** Piston Rings—give maximum compression and power; reduce carbon trouble and cylinder wear.

Whatever the make, model or type of automobile, tractor, truck, motorcycle or boat, gas engine, pump, compressor, etc., there is a McQuay-Norris **LEAK-PROOF** Piston Ring manufactured expressly for it. Every ring—from smallest to largest—embodying the exclusive McQuay-Norris **LEAK-PROOF** design; made to the same unvarying standard of accuracy in fit and finish; backed by seven years of successful performance records that have estab-

lished its supremacy in every motor field.

Obtainable anywhere—any time. In all standard sizes and all over-sizes—no matter how unusual. Your dealer, garage or repair man carries them, or can get them for you promptly. Over 300 jobbing and supply houses carry complete service stocks. Over 2,000 sizes and over-sizes are kept constantly on hand at the factory. Ask for—and be sure you get—the Genuine McQuay-Norris **LEAK-PROOF** Piston Rings.

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**McQuay-Norris Mfg. Co., St. Louis, U.S.A.**

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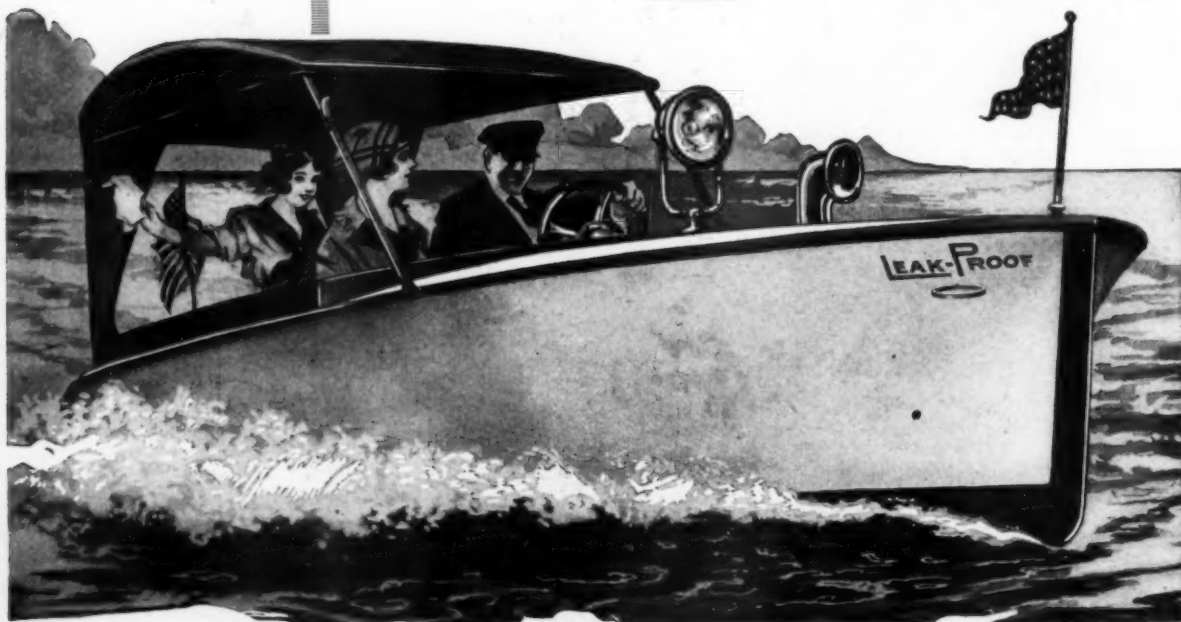
New York Chicago Pittsburgh San Francisco Los Angeles Seattle Kansas City  
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Canadian Factory: W. H. Banfield & Sons, Ltd., 372 Pape Ave., Toronto

Send for Free booklet. "To Have and to Hold Power"—a truthful, clear explanation of piston rings—their construction, development and operation. Write Dept. B.

**Is Your Engine  
An Oil Gusher?**

If your motor is having excess oil trouble it needs one McQuay-Norris **Superprof** Ring in the top groove of each piston, with McQuay-Norris **LEAK-PROOF** Piston Ring equipment in the lower grooves to insure maximum compression, power and fuel economy. The McQuay-Norris **Superprof** is a specially constructed ring with an Oil Reservoir which collects all of the excess oil from the cylinder wall on the down stroke of the piston, leaving just the film necessary for proper lubrication.



# JOES

## REVERSE GEARS

**I**F you want to "get to go" in your motor boat, the very most important thing next to the motor is the *Reversing Gear*.

Don't forget that fact.

Joes Duplex Drive Heavy Duty Gear solves that problem for Work Boat Motors. The same type of gear is also equally suitable for the highest speed boats.

Joes Famous High Power Gears for high and medium speed motors are unexcelled.

Joes Absolute Neutral One-Way Clutches are designed for all high speed uses and Joes regular One-Way Clutch is designed for all ordinary uses.

Send For Complete Catalog.

**THE SNOW & PETRELLI  
MFG. CO.**

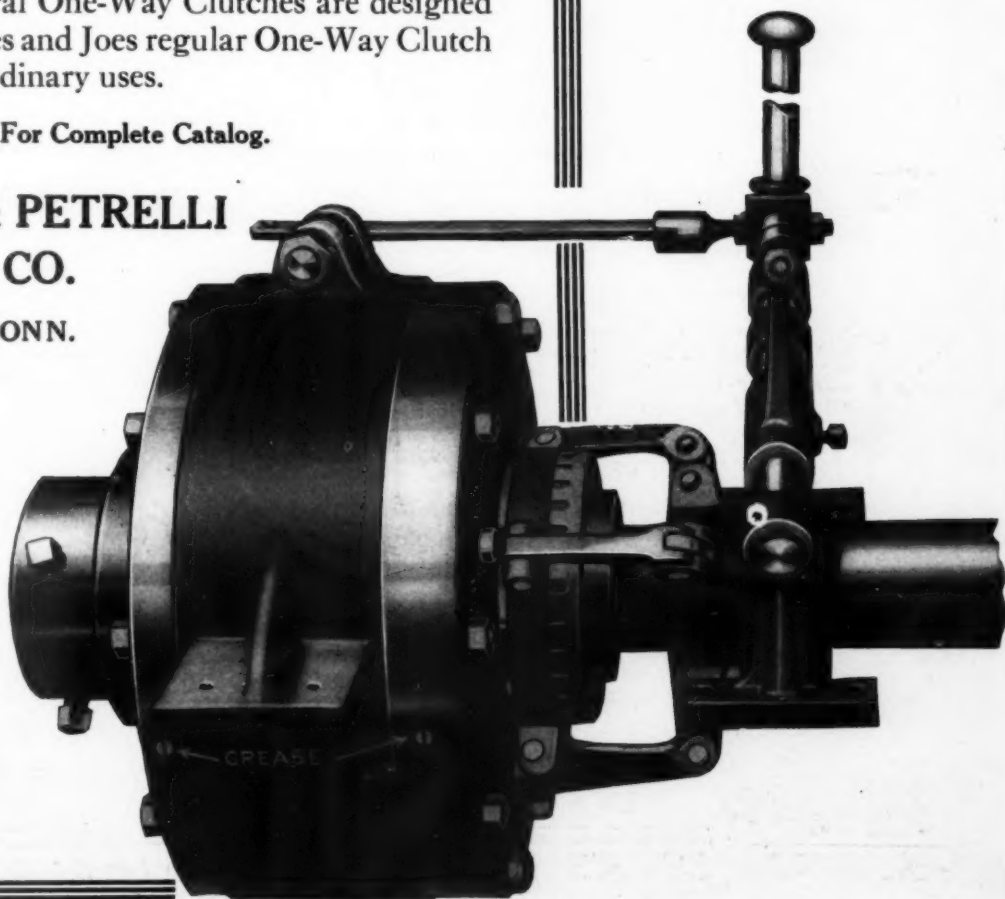
**NEW HAVEN, CONN.  
U. S. A.**

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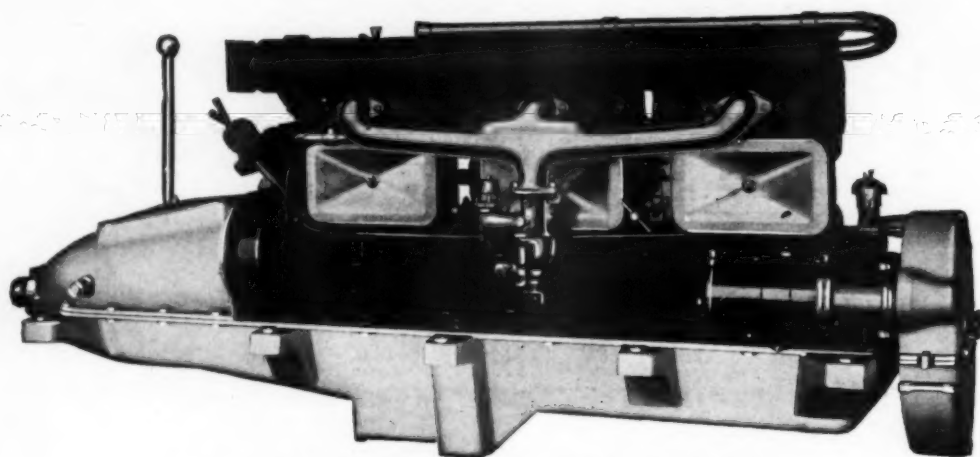
Safety Rear Starter with Adjustable Frame

A great assistance in starting and a genuine protection against injury



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# Scripps



## A NEW SCRIPPS

Model D-6, 60-75 H. P.

It's a clean, quiet, smooth, long-stroke six cylinder answering the insistent demand for a motor to correct the excessive vibration, noise and other objectionable features of the typical big four cylinder engine above 50 H.P.

It offers speed combined with dependability and durability. The Scripps Motor Company has never sacrificed durability in response to the temporary demand for extreme high speed and light weight. As a result, SCRIPPS motors sold ten years ago are still in service and giving perfect satisfaction. The D-6 is not a heavy engine but weight has been used where it counts most.

The balanced crankshaft is manufactured by the Park Drop Forge Company, is specially heat treated and of exceptionally large diameter, which, with the large main bearings and connecting rod bearings offer the most liberal proportions found in any marine motor of like power.

Lubrication is force feed by means of a gear pump to all main bearings and reverse gear. An oil cooler is carried in the oil reservoir. There are only two grease cups on the entire motor and even these (on the water pump) might be dispensed with.

Perfect cleanness is insured by the oil tight enclosure of all working parts.

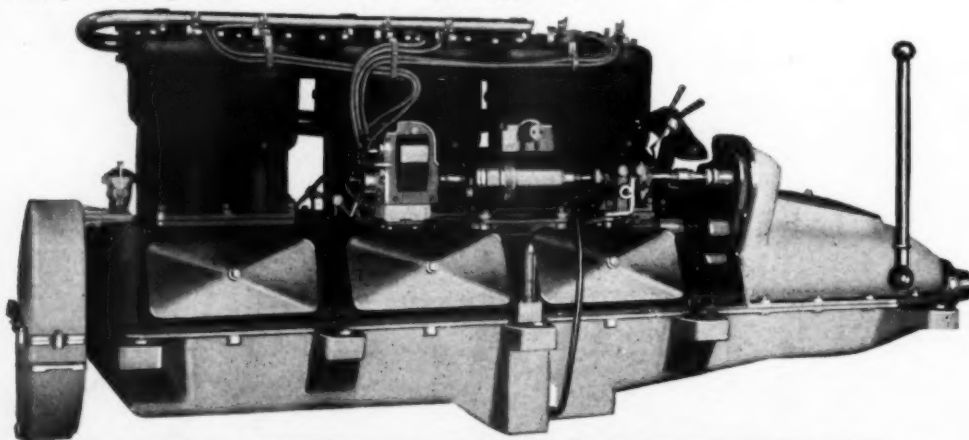
Unusual accessibility is an outstanding feature. Removable cylinder heads (almost a necessity for the removal of carbon deposits in this present day of low grade fuel), and unusually large hand hole plates located in the crankcase, permit the removal of pistons and connecting rods with bearings without disturbing the motor proper. An ordinary end wrench will handle every nut on the engine.

Kerosene, distillate and other similar low grade fuels offer no new problem to the SCRIPPS. For nine years we have been shipping successful kerosene motors to all parts of the world, and the D-6 has naturally been designed with a view to meeting present day fuel conditions.

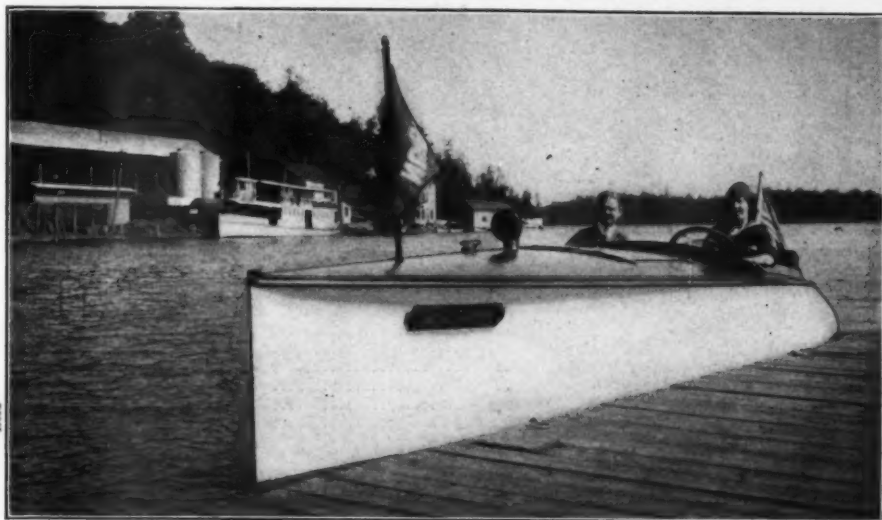
The D-6 is a new model with nothing new or untried. SCRIPPS motors have always been good motors and we have incorporated only time-tried practice with up to date refinement in the D-6.

Prompt delivery is offered through the fact that the motor was actually in production with forgings and material on hand before this—the first public advertisement—was released. This is only in keeping with the SCRIPPS policy of conservatism.

Only a few of the many desirable features have been dwelt upon here. Fullest details and catalog, describing other sizes from 10 H.P. up, on application.



SCRIPPS MOTOR CO., 631 Lincoln Ave., Detroit, Mich.



# Let YOUR Daughter Do It

A Fay & Bowen "JUNIOR RUNABOUT" is an ideal boat for your daughter or your wife to operate.

24 ft. long and 5 ft. beam, not too large to handle and control with ease, it has a ten-foot cockpit, and between the back of the forward seats and the front of the rear seat there is a clear space of five feet giving ample room for chairs.

Of construction, equipment and finish, it is sufficient to say that they are up to the high standard of all Fay & Bowen boats.

Under date of Nov. 19th, 1917, a client writes us:

*"The Junior Runabout I bought from you in the spring of 1916 has run absolutely perfect. In the two years the boat never refused to start, or stopped, or needed adjustment, and I have not paid a cent for repairs. During all this time the boat has been handled and run entirely by my daughter."*

The picture above shows the boat to which this customer refers.

Another client, a young girl, writes us under date of Jan. 17th, 1918, about her Junior Runabout:

*"It runs beautifully and has given me no trouble whatever."*

Write and ask us for full particulars of this boat and its equipment, or for corresponding information about our other sizes and models.

And don't forget our full line of engines. "None better built."



Four-cycle Engines  
Two-cycle Engines  
Finished Motor Boats  
Electric Lighting Units  
and Pumping Sets

## FAY & BOWEN ENGINE CO.

104 Lake Street, Geneva, N. Y., U. S. A.

New York Office: 50 Church Street, on Concourse, Sutter Bros., Representatives  
Made for Canada by the St. Lawrence Engine Co., Ltd., Brockville, Ont.

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# **-Don't Scrap-**

## **Those Scored or Defective Cylinders**

Cylinders which are either deeply or lightly scored or which are defective due to blow holes or sand pockets in the original castings can be Perfectly and Permanently repaired, refinished to original contour to machined cylinder bore.

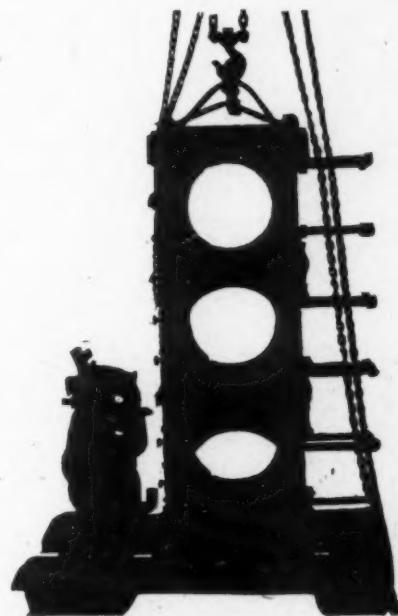
### **THE LAWRENCE PATENT PROCESS**

By our exclusive *patented process* we electrically fuse a silver-nickel alloy into the scores or defects. This restores the surface to its original accuracy and makes the old pistons and rings fit as snug as when new. This is done **WITHOUT HEAT** and cannot warp or harm the cylinders. The bore of cylinder is not enlarged.

#### **Work Guaranteed for the Life of Motor**

A number of the highest grade automobile and motor manufacturers are regular customers. Our process has enabled them to economize in production by saving from the scrap-heap many expensive cylinder castings which otherwise would have had to be discarded.

Many prominent yachtsmen, repairmen and garage owners can also testify to the quality and permanence of our work.



Cylinder casting from one of the six-cylinder, 12 by 14-inch Standard engines in James D. Lacey's 105 by 15½-foot motor yacht *Alcalde* after the wrist pin scores had been filled by the Lawrence process. Beside it is a 3½-inch bore automobile cylinder casting.

A 28-inch cylinder after being repaired which had 50-inch scores caused by lack of lubrication. The size of this job is clearly shown by comparison with Mr. Lawrence, standing beside the cylinder. 500 horsepower.



Write today for full details and quotations on repairing the cylinders of your engine.

#### **L. Lawrence & Co.**

Est. 1862

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# Everything Points to the

## KERMATH

### The Engine that Sells Itself

Some things are obvious. The reason for buying a Kermath is one of them. For it's a high quality engine at a price that means 100 cents worth of value to the dollar. And when anyone offers you more than that, look out.

The millionaire may have to buy the highest priced engine to maintain his social position. The poor man may have to buy the cheapest engine to keep his family from calling him extravagant. But the other 98% of us know that we want maximum hours of good service per dollar, not maximum pounds of engine per dollar, so we look around pretty carefully when we buy.

That's why so many Kermaths are sold. They appeal to the motor-wise boat owner, the man who has learned how to steer clear of the balky engine, the man who knows a good engine as far as he can see it.

Take a look at the Kermath engine. The more you know about good engine construction, the more you will appreciate this one. It's got everything you want—power, dependability, strength, economy. It has good materials and the most approved design. It's good enough for the finest boats afloat.

The big demand for Kermath engines enables us to build them in quantity. That means efficient manufacturing and economical production. We can build a hundred engines at lower cost per engine than we could build ten—and make them better engines too.

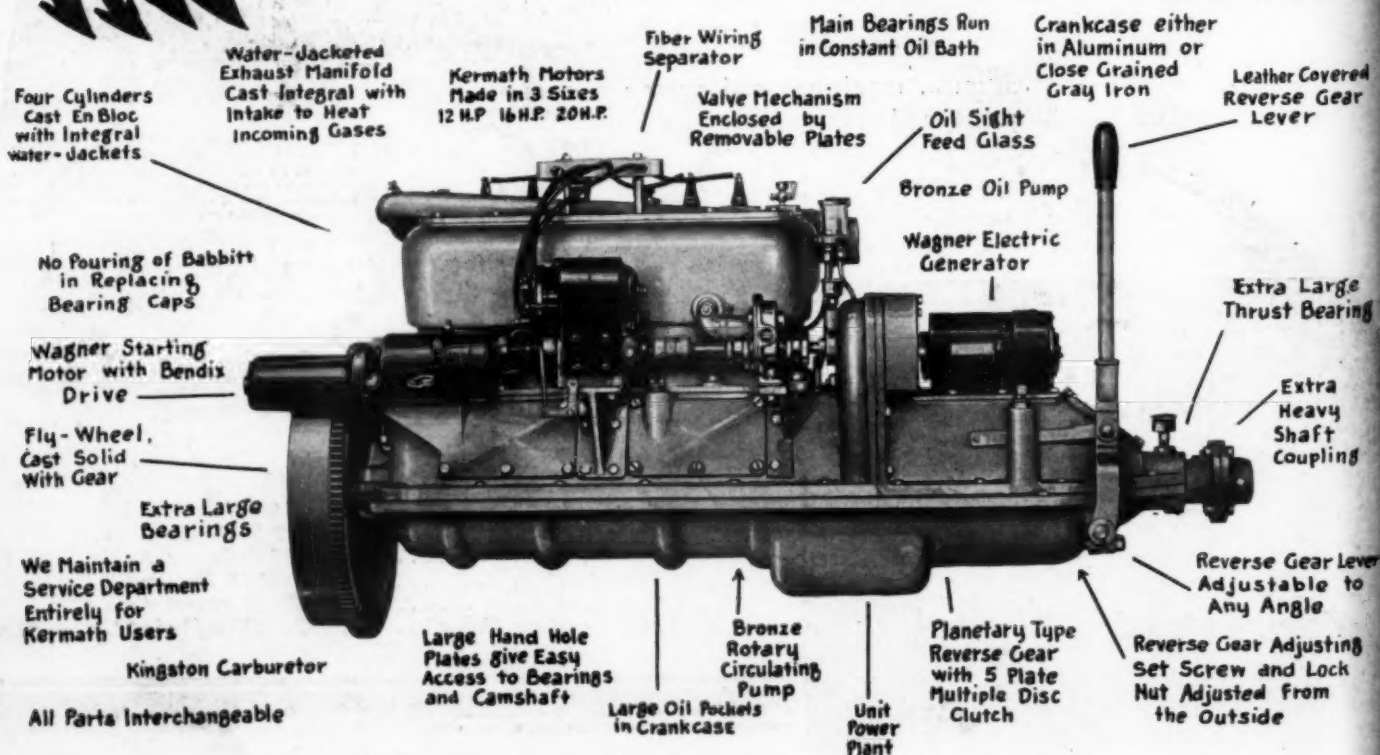
Write for the Kermath book. It tells what you want to know about the next engine you buy. You'll enjoy reading it. Sent free on request.

10-12 H.P.  
\$295 and up

16-18 H.P.  
\$320 and up

20-25 H.P.  
\$370 and up

**Kermath Manufacturing Company**  
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Detroit, Mich.



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